

Municipal Journal

Volume XXXVII

NEW YORK, JULY 2, 1914.

No. 1

QUEEN ANNE BOULEVARD, SEATTLE

To Make Pleasantly Accessible One of the Highest View Points of the City—Supported by Concrete Retaining Wall Forty-Six Feet High—Appliances and Methods of Construction

By CLAUDE A. OSIER.*

What will be, when completed, the largest concrete retaining wall in the Pacific northwest is now under construction in Seattle, Washington, in the residence section known as "Queen Anne Hill." This retaining wall will support a portion of the Queen Anne Boulevard, which will girdle one of the highest points in the city and will cost complete about \$1,000,000, that portion which includes the massive retaining wall requiring about \$100,000 of this. This section of the roadway is known as Divisions 4, 5 and 6.

Seattle is built on a number of hills, the more important being Queen Anne, Capitol, Beacon and West Queen Anne hills. The entire residence section is located on these eminences—the business section of the city has been hydraulicked and graded down until the main thoroughfares are practically level. The beauty spots, however, rise above the city streets, and to make these more accessible, the boulevard system has been evolved. This system, when completed, will encircle the entire city of Seattle, and will represent the outlay of \$10,000,000. The cost of the work will be assessed to the city as a whole.

The contract for the construction of the retaining wall along Divisions 4, 5 and 6 was awarded to the Washington Construction Company, 625 Northern Bank Building, Seattle, in December, 1913, with the provision that the work was to be completed by July 1, 1914. John McGrath is president of the Washington Construction Company, and E. B. Sheble, civil engineer, is secretary and manager, and has entire charge of the construction of this improvement. The plans were prepared by A. H. Dimock, city engineer.

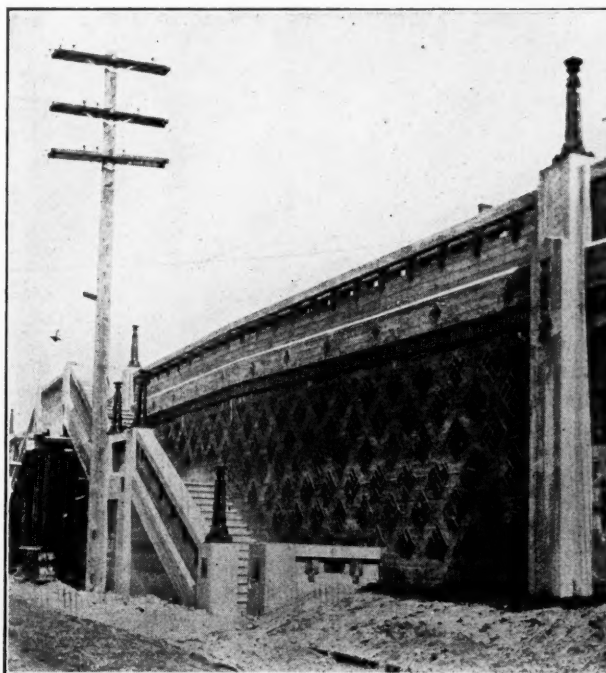
Division 4 lies on 7th Avenue West, from Home street to Crockett street, and consisted of constructing

a concrete bulkhead in front of an existing wooden bulkhead, which was thirty feet in height. Considerable difficulty was experienced in holding up the old bulkhead, as it had rotted badly, and timber bracing had to be placed and the concrete wall built around same. Much care had to be observed also, as sewer and water mains were located behind the wooden bulkhead. Earth was thrown out below, and scraped behind a finished section, the excavating being done with a one-yard Haywood clam-shell bucket, deriving its power from an 8¼x10 Lambert engine (as shown in cut). On this portion of the improvement, the material for the concrete forms was delivered to the mixer by wheelbarrows and distributed by chutes to the forms.

On Division 5, the earth was excavated and piled on the upper side and levelled off and a construction track was laid on it, and the mixer had sufficient elevation to permit of chuting the concrete. In this portion of the work, the plans called for expansion joints every fifty feet, these to go through the footings as well as the wall. This increased the cost of the work, as so much time was taken up in moving to alternate sections,

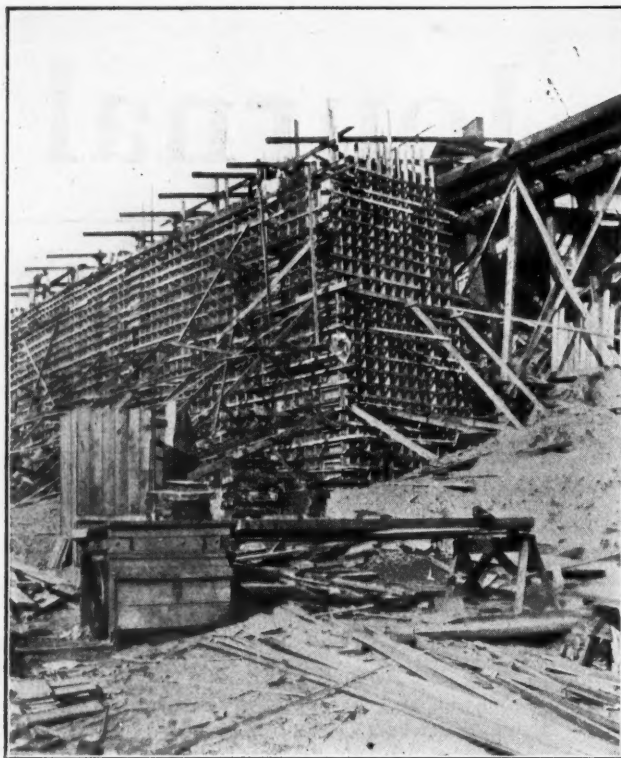
and it was conclusively proven on this job that expansion joints should be from 100 to 150 feet apart, as the range of temperature is not great in this locality.

On Division 6, it was found necessary to build a trestle about thirty feet high, upon which both the Haywood clam-shell bucket and the No. 20 Koehring mixer were operated and the track built. Sheet piling was driven along the side of the trestle to support the earth. The wall at this point is 46 feet high, and is of the counterfort type, reaching a height of 46 feet with a width of footings of 21 feet, and is quite heavily reinforced. The wall proper has two sets of reinforcement, one near the center of the wall and the other near the



FINISHED WALL AND STAIRS.

*From data supplied by E. K. Sheble, C. E., Manager for the Contractor.



FORM WORK ON A 46-FOOT WALL.
Trestle in the rear.

back surface. The horizontal reinforcement consisted of $\frac{3}{4}$ -inch square bars spaced 6 inches on centers at the bottom of the wall, the spacing increasing by degrees to 12 inches centers at the top of the wall. The vertical reinforcement consisted of $\frac{5}{8}$ -inch square bars spaced 18 inches centers. The vertical part of the wall was made 14 inches wide at the top, increasing to a bottom thickness of 20 to 24 inches. The inner footing of the heaviest section was 2 feet 6 inches thick, and extended about $13\frac{1}{2}$ feet from the center of the wall under the embankment, while the other footing extended about 7 feet 6 inches from the center of the wall in the other direction and had a thickness of 2 feet 6 inches at the toe and 3 feet 1 inch at the wall. These footings also were reinforced with two sets of reinforcing bars, both longitudinal and across. Each counterfort extended from the end of the inner footing to the top of the wall, and these also had two sets of reinforcement. At each expansion joint the bars in the back of the wall were omitted and the bars in the front of the wall were bent 12 inches into the counterfort. The specifications originally called for billet steel, but were later changed to re-rolled rail high carbon steel, made by a local concern. The bars were corrugated.

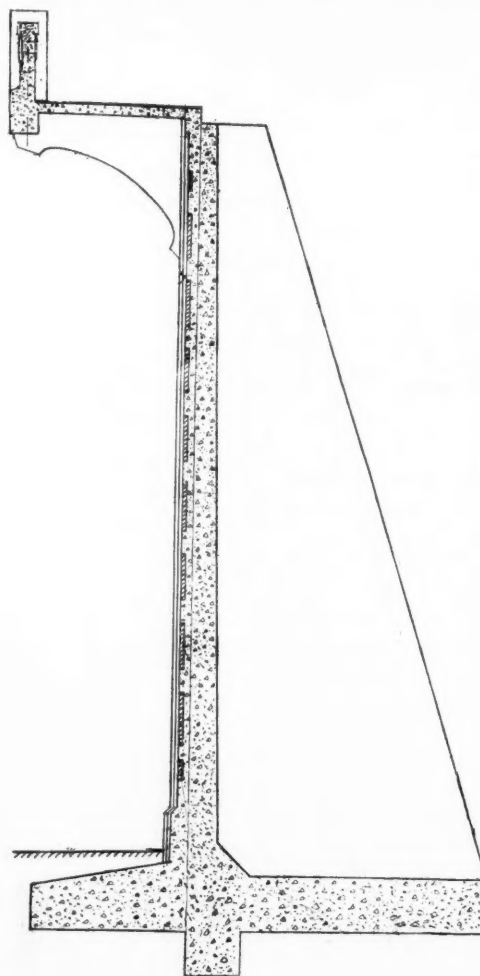
The forms used on this job were constructed of 2x6's spaced 18-inch centers and lined with shiplap, wrong side to the wall. No. 10 wire was used for fastening and wood inserts were nailed to the form, so as to leave space for brick work in the front face, as shown in figure 1. The insert consisted of a frame 18 inches square of 1-inch lumber, and into this frame set two blocks, 3x10x18 inches, bevelled on four sides. These come out very easily, leaving a space for the brick. The opening left for the brick was 18 inches square, and was later filled with 8-inch sewer bricks placed flat-ways, with a large joint.

The form work on the three divisions cost from \$1 to \$3 per cubic yard of concrete. The concrete was mixed in proportion of one part cement, 2 parts sand and 4 parts gravel, by a No. 20 Koehring mixer with a maximum capacity of 200 cu. yds. per day. The cost of

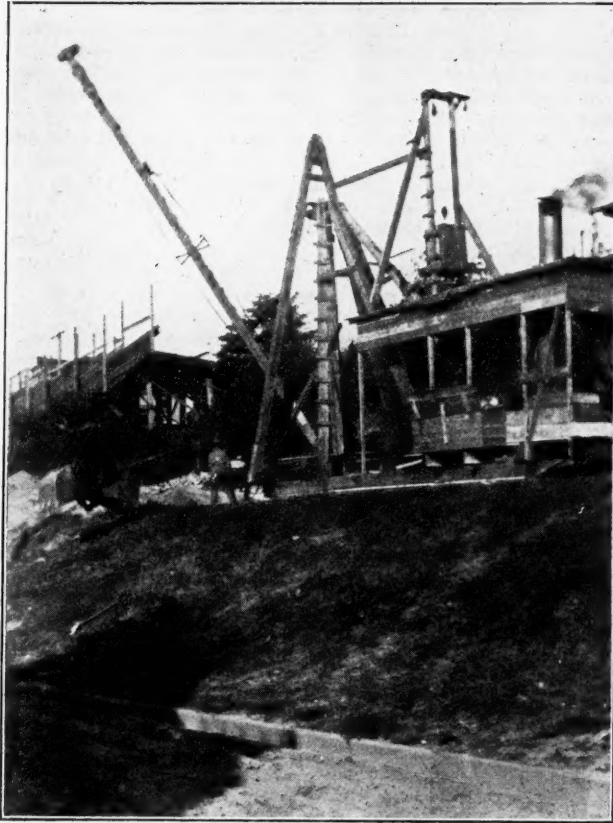
mixing and placing concrete ranged from 40 cents to \$1 per cu. yd.

Large bunkers and cement sheds were built especially for Divisions 5 and 6, these having a capacity of 150 cu. yds. of sand and gravel, and 3,000 sacks of cement. These materials were transported from the city warehouses to the work by auto trucks, and the bunkers were built on a side hill, so that the auto trucks would deliver on one street and the materials slide down to the street below. The bunkers represent an outlay of \$1,200, and are of heavy mill construction. A track extends from the bunkers to Divisions 5 and 6 which cost about \$1,200. Specially designed dump cars were built, which loaded at the bunkers first with sand, then cement, then gravel, sufficient for a $\frac{1}{2}$ -yard batch. Three of these cars were hauled at one time by a 9-ton Davenport locomotive to the mixer. This mixer followed the work, and the concrete was distributed by chutes to the forms.

In this section the trestle was built on three rows of 8x8 posts, the middle row vertical and the side rows battered. This was built on a side slope, and each bent was prevented from sliding down the slope by another post making an angle of perhaps 30 degrees to the horizontal with its lower end abutting against an anchor post and its upper end against the lower batter post of the bent. As the wall was to be built immediately down hill from the trestle, and the foundation of the wall required excavating several feet below the original surface, this precaution against sliding was necessary. In excavating for the foundation, sheet piling was driven on the uphill side of this excavation to prevent the slipping of the earth and of the trestle which it carried.



SECTION OF WALL,
Showing counterfort, sidewalk and supporting bracket and railing.



CLAM SHELL EXCAVATING FOR WALL.

Each bent of three trestle posts included a 10x10 cap which carried two tracks, one for the concrete mixer and the other for the cars bringing the material to it. The two wheels on each side of the concrete mixer were carried by a platform resting on three 4x12's, and the track for the material cars was supported by another set of 4x12's resting on pillow blocks, which elevated it about a foot higher. The clam shell bucket excavator traveling on one of these tracks excavated the trench for the wall and piled the material on the uphill side of the trestle. Where there was not sufficient room above the trestle for this earth, a one-yard Baglet scra-



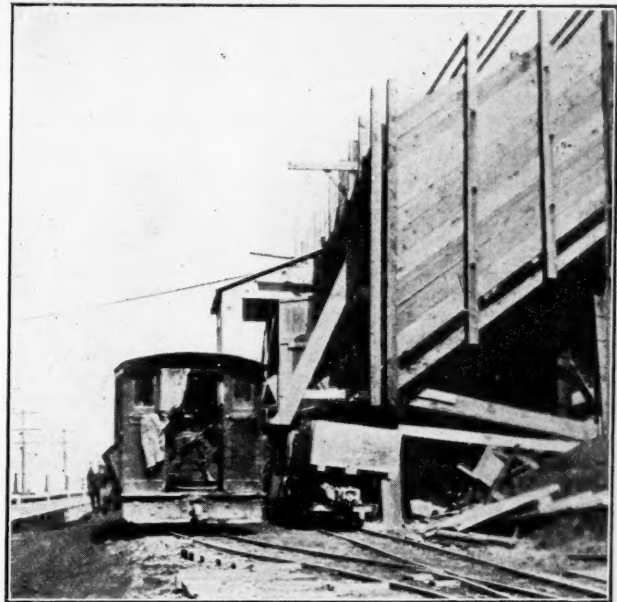
SPECIAL CARS FOR CARRYING CONCRETE MATERIALS AND DISCHARGING SAME INTO MIXER.

per pulled the earth behind the part of the wall which had already been completed. Over part of this division no trestle was necessary, but the material from the wall excavation was embanked immediately behind it, and the construction tracks laid on the top of this fill. The cost of excavation of divisions 4, 5 and 6 ranged from 6 cents to 20 cents per cubic yard.

As the excavation was completed, the concrete mixer was run forward to continue the wall construction. Concrete was spouted from the mixer directly to the forms through a long flume supported from a boom which was carried by the same traveller as the mixer. The sand, cement and gravel for one batch were placed in a dump car and carried in this to the mixer, thus doing away with all measuring of materials at the mixer and greatly expediting the work, so that the mixer was kept operating continuously.

Before backfilling, the rear of the wall was waterproofed with two coats of grade D asphalt, to prevent moisture from appearing on the front face, and a 4-inch tile drain was placed to carry off any water. The specifications called for the front face of the wall to be left as stripped, thus showing a rough finish from the boards—which is more likely to catch all sorts of dirt in the air.

An over-hanging sidewalk 8 feet wide has been built, which is held by brackets from the wall. A concrete



LOADING CARS WITH CONCRETE MATERIALS AT BUNKERS.

railing 3 feet 6 inches high has been constructed, upon which there is an ornamental lighting standard every fifty feet.

The appearance of the wall has been greatly improved by the construction of three sets of concrete stairs, running up the front of the wall. One of these stairs is exceedingly complicated, consisting of two broken flights and having more than 150 risers.

The excavation will be allowed to settle for one year, when the contract for paving will be let.

Divisions 4, 5 and 6 are 3,000 feet long. In preparation for the building of the wall, 20,000 cubic yards of earth was excavated. The wall will contain 7,000 cubic yards of concrete, and 328 tons of reinforcing steel, and has a maximum height of 46 feet.

The Park Board has already begun the planting of beautiful flowers and ornamental shrubbery, to further enhance the artistic appearance of this magnificent improvement. The roadway at this point is 60 feet wide,

and from it can be obtained an unequalled panorama of the majestic Olympic mountains, of Puget Sound, and the city of Seattle.

SPECIFICATIONS FOR CONCRETE PAVEMENTS

Proposed by American Concrete Institute and Recommended by National Conference on Concrete Road Building—One Course and Two Course

We are continually receiving inquiries for specifications for concrete pavements, and to meet this demand are printing below, in full, the standard specifications proposed by the American Concrete Institute, and recommended by the National Conference on Concrete Road Building this year. The committee of the former organization which prepared the specifications consisted of C. W. Boynton, inspecting engineer Universal Portland Cement Company, Chicago; Edward N. Hines, chairman Board of County Road Commissioners of Wayne County, Detroit, Mich.; Thomas H. MacDonald, state highway engineer, Ames, Iowa; A. R. Hirst, state highway engineer, Madison, Wis.; James R. Marker, state highway commissioner, Columbus, Ohio; H. G. Shirley, chief engineer Maryland State Roads Commission, Baltimore, Md.; A. N. Johnson, state highway engineer, Springfield, Ill.; Percy H. Wilson, secretary Association of American Portland Cement Manufacturers, Philadelphia, Pa.; Fred C. Smith, city engineer, Sioux City, Iowa; Fred Charles, city engineer, Richmond, Ind.; John B. Hittell, civil engineer, Board of Local Improvements, Chicago.

The National Conference recommended as fundamental principles that:

1. The aggregates should be clean and hard.
2. The sand should be coarse and well graded.
3. A rich mixture should be used.
4. The materials should be correctly proportioned.
5. The materials should be thoroughly mixed.
6. The inspection should be intelligent and thorough.
7. When in doubt, reinforce the pavement.
8. The subgrade should be of uniform density, thoroughly compacted and drenched with water immediately before placing concrete.
9. The concrete should be of a viscous, plastic consistency.
10. After placing, the concrete should be immediately covered and kept moist and not opened to traffic for four weeks.

Many other details of standard practice, most of which are contained in the specifications, were mentioned by the conference committee. Among the more important or novel were the following:

THICKNESS.—The thickness of the concrete pavement is controlled by many factors, such as condition and character of the subgrade, drainage, traffic, climatic conditions, width of pavement, etc. Three distinct types of cross sections are in general use:

1. Uniform thickness of concrete for all widths of roadway and consequently the same amount of crown in the foundation as in the surface.
2. Roadways in which the concrete is thicker at the center than at the edge, but in which some crown is given to the foundation.
3. Concrete roadways in which the concrete is thicker at the middle than at the edge, but which are built upon a flat subgrade.

The Conference recommends the latter type for all roadways of twenty (20) feet or less in width.

WIDTH.—The Conference recommends that the minimum width be ten (10) feet for single track roads and eighteen (18) feet in width, for double track roads. For roads eighteen (18) feet or more in width, it is unnecessary to provide turnouts of gravel or macadam shoulders, which greatly increase the cost of maintenance.

CROWN.—Unlike some types, concrete pavements are

not damaged by water. If it were not for the need for drainage, a perfectly flat road would be preferable because it would lead to a better distribution of the traffic. Since thin sheets of water or ice on the surface of any pavement are objectionable, a slight crown should be provided to insure drainage of the surface, and the Conference is of the opinion that for country highways a crown of one one-hundredth (1/100) of the width is sufficient. Because of the peculiar needs for drainage in cities, a crown of one-seventieth (1/70) of the pavement width will usually be found ample. On steep grades this crown may be correspondingly reduced.

JOINTS.—Joints are a source of trouble, even if properly spaced and properly constructed, and, if possible, should be avoided. These joints necessarily interrupt the continuity of the pavement and are a source of expense in maintenance.

The Conference is of the opinion that where joints are used they should be located at intervals of from 25 to 50 feet, although under favorable conditions longer sections have been successfully used.

REINFORCING.—The Conference is of the opinion that all roads exceeding twenty (20) feet in width should preferably be reinforced with some form of metal fabric and recommends that the cross-sectional area of the reinforcing metal running parallel to the center line of the pavement should be about 0.038 square inch per foot of pavement width and of metal running transversely 0.049 square inch per foot of pavement length, the purpose of such reinforcing being to distribute the effect of expansion and contraction due to temperature changes and moisture content of the concrete, as well as the weight of traffic over defects in the subgrade. The reinforcement should be embedded at least two (2) inches and not more than three (3) inches below the surface of the pavement.

MIXING.—The Conference is decidedly of the opinion that the durability of a concrete road is largely affected by the proper proportioning and thorough mixing of the ingredients.

CONSISTENCY.—The practice is to mix concrete entirely too wet. The consistency should be such as not to require tamping, but not so wet as to cause the separation of the mortar from the aggregate in handling and placing. The concrete, when properly mixed, should have a viscous, plastic consistency.

CURING AND PROTECTING.—The curing of the exposed surface of concrete is a matter of the greatest importance. Good concrete can be easily destroyed by too rapid drying out or opening it to traffic at too early a period. It is, therefore, highly desirable that the finished pavement should be covered with sand or earth and kept sprinkled for a period of at least fourteen (14) days, the purpose of which being to keep the concrete moist, and to prevent the evaporation of the water which is necessary for the proper hardening of the concrete. Where conditions will permit the Conference would recommend that the concrete pavement be not opened to traffic until after an interval of at least four weeks, during which period it shall be protected as above described.

PROPOSED STANDARD SPECIFICATIONS OF THE AMERICAN CONCRETE INSTITUTE, 1914, RECOMMENDED BY THE NATIONAL CONFERENCE ON CONCRETE ROAD BUILDING.

ONE COURSE CONCRETE HIGHWAY.

I. MATERIALS.

1. **CEMENT.**—The cement shall meet the requirements of the Standard Specifications for Portland Cement, adopted by the American Society for Testing Materials, August 16, 1909, with all subsequent amendments and additions thereto adopted by said society.

When the cement is not inspected at the place of manufacture, it shall be stored a sufficient length of time to permit of inspecting and testing. The engineer shall be notified of the receipt of each shipment of cement.

2. **FINE AGGREGATE.**—Fine aggregate shall consist of sand or screenings from clean, hard, durable crushed rock or gravel, consisting of quartzite grains or other equally hard material, graded from fine to coarse, with the coarse particles predominating and passing, when dry, a screen having one-fourth ($\frac{1}{4}$) inch openings. It shall be clean, hard, free from dust, loam, vegetable, or other deleterious matter. Not more than twenty (20) per cent shall pass a sieve having fifty (50) meshes per linear inch, and not more than five (5) per cent shall pass a sieve having one hundred (100) meshes per linear inch.

Fine aggregate containing more than three (3) per cent of clay or loam shall be washed before using.

Fine aggregate shall be of such quality that the mortar composed of one (1) part Portland cement and three (3) parts fine aggregate by weight, when made into briquettes, shall show a tensile strength at least equal to the strength of 1:3 mortar of the same consistency, made with the same cement and Standard Ottawa sand. In no case shall fine aggregate containing frost or lumps of frozen material be used.

3. COARSE AGGREGATE.—Coarse aggregate shall consist of clean, hard, durable crushed rock or gravel, graded in size, free from dust, loam, vegetable or deleterious matter, and shall contain no soft, flat or elongated particles. The size of the coarse aggregate shall be such as to pass a one and one-half ($1\frac{1}{2}$) inch round opening and be retained on a screen having one-quarter ($\frac{1}{4}$) inch openings. In no case shall coarse aggregate containing frost or lumps of frozen material be used.

4. NATURAL MIXED AGGREGATE.—Natural mixed aggregate shall not be used as it comes from deposits but shall be screened and used as specified.

5. WATER.—Water shall be clean, free from oil, acid, alkali or vegetable matter.

6. REINFORCEMENT.—Concrete pavements twenty (20) feet or more in width shall be reinforced with metal fabric. All reinforcement shall be free from excessive rust, scale, paint or coatings of any character which will tend to destroy the bond. All reinforcement shall develop an ultimate tensile strength of not less than 70,000 pounds per square inch and bend 180 degrees around one diameter and straighten without fracture.

7. JOINT FILLER.—Joint filler shall consist of prepared felt or similar material of approved quality having a thickness of not less than one-eighth ($\frac{1}{8}$) nor more than one-quarter ($\frac{1}{4}$) inch.

8. JOINT PROTECTION PLATES.—Soft steel plates for the protection of the edges of the concrete at transverse joints shall be not less than two and one-half ($2\frac{1}{2}$) inches in depth and not less than one-eighth ($\frac{1}{8}$) nor more than one-quarter ($\frac{1}{4}$) inch average thickness. The plates shall be of such form as to provide for rigid anchorage to the concrete. The type and method of installation of joint protection plates shall be approved by the engineer.

9. SHOULDERS.—Materials for the construction of shoulders shall be approved by the engineer.

II. GRADING.

10. DEFINED.—The term "grading" shall include all cuts, fills, ditches, borrow pits, approaches and all earth moving for whatever purpose where such work is an essential part of or necessary to the prosecution of the contract. When, to bring the surface to grade, a fill of one (1) foot or less is required, the area shall be thoroughly grubbed. All soft, spongy or yielding spots and all vegetable or other objectionable matter shall be removed and the space refilled with suitable material.

11. ENGINEER'S STAKES.—Stakes will be set by the engineer for the center line, side of slopes, finished grade and other necessary points properly marked for the cut or fill.

12. EXCESS MATERIAL.—Excess material shall be disposed of as directed by the engineer, the free haul not to exceed feet.

13. OVER-HAUL.—Materials hauled a greater distance than the free haul from the place of excavation shall be paid for at the rate of cents per cubic yard for each additional feet.

14. FILLS.—Embankments shall be formed of earth or other approved materials and shall be constructed in successive layers, the first of which shall extend entirely across from the toe of the slope on one side to the toe of the slope on the other side, and successive layers shall extend entirely across the embankments from slope to slope. Each layer, which shall not exceed one (1) foot in depth, shall be thoroughly rolled with a roller weighing not less than five (5) tons nor more than ten (10) tons before the succeeding layer is placed. The roller shall pass over the entire area of the fill at least twice.

The sides of the embankment shall be kept lower than the center during all stages of the work and the surface maintained in condition for adequate drainage. The use of muck, quicksand, soft clay or spongy material which will not consolidate under the roller is prohibited.

When the material excavated from the cuts is not sufficient to make the fills shown on the plans, the contractor shall furnish the necessary extra material to bring the fills to the proper width and grade. When the earth work is completed, the cross section of the road shall conform to

the cross sectional drawings and profile attached hereto.

15. SLOPES.—All slopes must be properly dressed to lines given by the engineer.

16. FINISHED GRADE.—When the grade line is approached, the final grade stakes will be set, for which sufficient notice must be given to the engineer.

(Note: In excavating cuts it is considered advisable, when the line of the subgrade is approached, to compact the remaining material by rolling. The depth of material left in the cut to be compressed to the finished grade by rolling will depend upon the character of the material.)

III. DRAINAGE.

17. DRAINAGE.—The contractor shall construct such drainage ditches as will insure perfect sub and surface drainage during construction, and such work shall be completed to the satisfaction of the engineer, prior to the preparation of the roadbed, as herein specified.

Tile drains shall be placed as shown in the drawings attached hereto. Tile to be laid in the trench at least (.....) inches wide and (.....) feet deep below the established grade of the finished pavement. Such trench shall be back filled with crushed stone or pit run gravel, with sand removed, which, after light tamping, shall be (.....) inches in depth.

Open ditches must be constructed along the concrete road as shown on the attached drawing, the dimensions, side slopes and grade of said ditches being as shown on the cross section drawings and profile attached hereto.

At the time of the acceptance of the road, the ditches must be in perfect condition, with clean slopes and bottom, containing no obstructions to the flow of water.

IV. SUBGRADE.

18. CONSTRUCTION.—The bottom of the excavation or the top of the fill when completed shall be known as the subgrade and shall be at all places true to the elevation as shown on the plans attached hereto.

The roadway shall be graded to the proper subgrade to permit of the specified thickness of paving materials being laid to bring the finished surface of the pavement to the lines and grades as shown on the plans.

The subgrade shall be brought to a firm, unyielding surface by rolling the entire area with a self-propelled roller weighing not less than ten (10) tons, and all portions of the surface of the subgrade which are inaccessible to the roller shall be thoroughly tamped with a hand tamper weighing not less than fifty (50) pounds, the face of which shall not exceed one hundred (100) square inches in area. All soft, spongy or yielding spots and all vegetable or other objectionable matter shall be entirely removed and the space refilled with suitable material.

Where considered necessary or of assistance in producing a compact, solid surface, the subgrade before being rolled shall be well sprinkled with water.

When the concrete pavement is to be constructed over an old roadbed composed of gravel or macadam, and the concrete is to be wider than the old gravel or macadam road, the latter shall be entirely loosened and the material spread for the full width of the roadbed and rolled. All interstices shall be filled with fine material, and rolled to make a dense, tight surface of the roadbed.

19. ACCEPTANCE.—No concrete shall be deposited upon the subgrade until it is checked and accepted by the engineer.

20. COMPLETION.—Upon the subgrade thus formed shall be laid the concrete pavement as shown in the plans attached hereto.

V. FORMS.

21. MATERIALS.—The forms shall be free from warp, of sufficient strength to resist springing out of shape, and shall be equal in width to the thickness of the pavement at the edges. Wooden forms shall be of not less than two (2) inch stock, and shall be capped with two (2) inch angle iron.

22. SETTING.—The forms shall be well staked or otherwise held to the established line and grades, and the upper edges shall conform to the established grade of the road.

23. TREATMENT.—All mortar and dirt shall be removed from the forms that have previously been used.

VI. PAVEMENT SECTION.

24. WIDTH, THICKNESS OF CONCRETE AND CROWN.—The concrete pavement shall be (.....) feet wide, (.....) inches in depth at center, and (.....) inches in depth at the sides. The finished surface shall conform to the arc of a circle, as shown on the plans attached hereto.

(Note: Crown shall be not more than one one-hundredth ($1/100$) of the width. The thickness of the concrete at the edges shall not be less than six (6) inches.)

VII. JOINTS.

25. **WIDTH AND LOCATION.**—Transverse joints shall be not less than one-quarter ($\frac{1}{4}$) inch nor more than three-eighths ($\frac{3}{8}$) inch in width and shall be placed across the pavement perpendicular to the center line, not more than 35 feet apart. When a curb is specified or where pavement abuts a building a joint not less than one-quarter ($\frac{1}{4}$) inch wide shall be placed between it and the pavement. All joints shall extend through the entire thickness of the pavement and shall be perpendicular to its surface.

26. **PROTECTION OF JOINTS.**—The concrete at transverse joints shall be protected with soft steel joint protection plates which shall be rigidly anchored to the concrete. The type and installation of the metal protection plates shall meet with the approval of the engineer. The surface edges of the metal plates shall conform to the finished surface of the concrete, as shown on the plans attached hereto.

All joints over one-quarter ($\frac{1}{4}$) inch high or one-half ($\frac{1}{2}$) inch low shall be removed.

27. **JOINT FILLER.**—All joints shall be formed by inserting during construction and leaving in place the required thickness of joint filler which shall extend through the entire thickness of the pavement.

VIII. MEASURING MATERIALS AND MIXING CONCRETE.

28. **MEASURING MATERIALS.**—The method of measuring the materials for the concrete, including water, shall be one which will insure separate and uniform proportions of each of the materials at all times. A sack of Portland cement (94 pounds net) shall be considered one (1) cubic foot.

29. **MIXING.**—The materials shall be mixed to the desired consistency in a batch mixer of approved type, and mixing shall continue for at least forty-five (45) seconds after all materials are in the drum. The drum shall be completely emptied before mixing successive batches. The drum of the mixer used shall revolve at a speed not less than the minimum nor more than the maximum number of revolutions shown in the following table:

Rated capacity cu. ft. unmixed material.	Capacity bags of cement 1 : 2 : 3 mix.	Revolutions per minute of drum	
		Min.	Max.
7 to 11	1	15	21
12 to 17	2	12	20
18 to 23	3	12	20
24 to 29	4	11	17
30 to 33	5	10	15

30. **RETEMPERING.**—Retempering of mortar or concrete which has partially hardened, that is, mixing with additional materials or water, shall not be permitted.

31. **PROPORTIONS.**—The concrete shall be mixed in the proportions of one (1) sack of Portland cement to not more than two (2) cubic feet of fine aggregate and not more than three (3) cubic feet of coarse aggregate, and in no case shall the volume of the fine aggregate be less than one-half ($\frac{1}{2}$) the volume of the coarse aggregate.

A cubic yard of concrete in place between neat lines shall contain not less than one and seven-tenths (1.7) barrels of cement.

The engineer shall compare the calculated amount of cement required according to these specifications and plans attached hereto with the amounts actually used in each section of concrete between successive transverse joints, as determined by actual count of the number of sacks of cement used in each section. If the amount of cement used in any three adjacent sections (between transverse joints) is less by two (2) per cent, or if the amount of cement used in any one section is less by five (5) per cent, than the amount hereinbefore required, the contractor agrees to remove all such sections and to rebuild the same according to these specifications at his expense.

32. **CONSISTENCY.**—The materials shall be mixed with sufficient water to produce a concrete which when deposited will settle to a flattened mass, but shall not be so wet as to cause a separation of the mortar from the coarse aggregate in handling.

IX. REINFORCING.

33. **REINFORCING.**—Concrete pavements twenty (20) feet or more in width shall be reinforced. The cross-sectional area of the reinforcing metal running parallel to the center line of the pavement shall amount to at least 0.038 square inch per foot of pavement width, and the cross-sectional area of reinforcing metal which is perpendicular to the center line of the pavement shall amount to at least 0.049 square inch per foot of pavement length.

Reinforcing metal shall not be placed less than two (2)

inches from the finished surface of the pavement and otherwise shall be placed as shown on the drawings. The reinforcing metal shall extend to within two (2) inches of all joints, but shall not cross them. Adjacent widths of fabric shall be lapped not less than four (4) inches.

X. PLACING CONCRETE.

34. **PLACING CONCRETE.**—Immediately prior to placing the concrete, the subgrade shall be brought to an even surface. The surface of the subgrade shall be thoroughly wet when the concrete is placed.

After mixing, the concrete shall be deposited rapidly in successive batches upon the subgrade prepared as hereinbefore specified. The concrete shall be deposited to the required depth and for the entire width of the pavement, in a continuous operation, between transverse joints without the use of intermediate forms or bulkheads.

In case of a breakdown, concrete shall be mixed by hand to complete the section or an intermediate transverse joint placed as hereinbefore specified at the point of stopping work. Any concrete in excess of that needed to complete a section at the stopping of work shall not be used in the work.

35. **FINISHING.**—The surface of the concrete shall be struck off by means of a template or strike board which shall be moved with a combined longitudinal and cross-wise motion. When the strike board is within three (3) feet of a transverse joint it shall be lifted to the joint and the pavement struck by moving the strike board away from the joint; any excess concrete shall be removed. Concrete adjoining the metal protection plates at transverse joints shall be dense in character and any holes left by removing any device used in installing the metal protection plates shall be immediately filled with concrete.

After being brought to the established grade with the template or strike board, the concrete shall be finished from a suitable bridge, no part of which shall come in contact with the concrete. The concrete shall be finished with a wood float in a manner to thoroughly compact it and produce a surface free from depressions or inequalities of any kind. The finished surface of the pavement shall not vary more than one-quarter ($\frac{1}{4}$) inch from the true shape.

The edges of the pavement shall be rounded as shown on the cross-sectional drawings attached hereto.

XI. PROTECTION.

36. **CURING AND PROTECTION.**—Excepting as hereinafter specified, the surface of the pavement shall be sprayed with water as soon as the concrete is sufficiently hardened to prevent pitting, and shall be kept wet until an earth covering is placed. As soon as it can be done without damaging the concrete, the surface of the pavement shall be covered with not less than two (2) inches of earth or other material which will afford equally as good protection, which cover shall be kept moist for at least ten (10) days. When deemed necessary or advisable by the engineer, freshly-laid concrete shall be protected by a canvas covering until the earth covering can be placed.

Under the most favorable conditions for hardening in hot weather the pavement shall be closed to traffic for at least fourteen (14) days, and in cool weather for an additional time, to be determined by the engineer.

If at the time the pavement is laid, or during the period of curing, the temperature during the day time drops below 50 degrees Fahrenheit, sprinkling and covering of the pavement shall be omitted at the direction of the engineer.

The contractor shall erect and maintain suitable barriers to protect the concrete from traffic, and any part of the pavement damaged from traffic or other causes, occurring prior to its official acceptance, shall be repaired or replaced by the contractor at his expense, in a manner satisfactory to the engineer. Before the pavement is thrown open to traffic the covering shall be removed and disposed of as directed by the engineer.

37. **TEMPERATURE BELOW 35 DEGREES FAHRENHEIT.**—Concrete shall not be mixed or deposited when the temperature is below freezing.

If at any time during the progress of the work the temperature is, or in the opinion of the engineer will within twenty-four (24) hours drop to 35 degrees Fahrenheit, the water and aggregates shall be heated, and precautions taken to protect the work from freezing for at least ten (10) days. In no case shall concrete be deposited upon a frozen subgrade.

XII. SHOULDERS.

38. **CONSTRUCTION.**—When shoulders are required, they shall be built upon the properly prepared subgrade, as shown on the profile and cross-sectional drawings attached thereto. The work shall be done to the entire satisfaction of the engineer.

ONE COURSE CONCRETE STREET PAVEMENT.

These specifications are the same as those for "Concrete Highway," except for the following, which are to be substituted for the corresponding portions of those specifications:

III. DRAINAGE.

17. DRAINAGE.—The contractor shall construct tile or other drains as shown in the drawings attached hereto. Tile to be laid in the trench at least (.....) inches wide, and (.....) feet deep below the top of the adjacent curb. Such trench shall be back filled with crushed stone or pit run gravel with sand removed, which after light tamping shall be (.....) inches in depth.

18. CATCH BASINS.—All catch basin and manhole tops and all covers of openings of any kind shall be readjusted to the grade by the contractor at his expense.

For the note under "VI. Pavement Section," substitute:

(Note: The thickness of the concrete at the edges shall not be less than six (6) inches. When pavements twenty (20) feet or less in width are to be built on approximately level ground and a flat subgrade is to be used, sufficient fall for drainage at the sides of the pavement along the curb shall be provided by giving the roadbed the same grade as that proposed for the gutter. The crown of all pavements shall not be more than one one-hundredth (1/100) of the width, except that when deemed advisable by the engineer, the crown of a pavement built on a crowned sub-grade may be increased to one-fiftieth (1/50) of the width to provide sufficient fall for drainage along the sides of the pavement at the curb.)

TWO COURSE CONCRETE STREET PAVEMENT.

These are the same as those for "One Course Concrete Street Pavement," except for the following: After "3. Coarse Aggregate" add

4. AGGREGATE FOR WEARING COURSE.—The aggregate for the wearing course shall consist of a mixture of two (2) parts of the materials specified under "Fine Aggregate," and three (3) parts of clean, hard, durable crushed rock or gravel, free from dust, soft particles, loam, vegetable or other deleterious matter, and passing when dry a screen having one-half (1/2) inch openings and retained on a screen having one-quarter (1/4) inch openings. In no case shall aggregate for wearing course containing frost or lumps of frozen material be used.

VI. PAVEMENT SECTION.**WIDTH, THICKNESS OF CONCRETE AND CROWN.**

—The concrete pavement shall be (.....) feet wide from face to face of curb. The base of the concrete pavement shall be (.....) inches in depth at the center and (.....) inches in depth at the sides. The wearing course shall be of (.....) inches uniform thickness. The finished surface shall conform to the arc of a circle as shown on the plans attached hereto.

(Note: The minimum thickness of the concrete base shall be not less than five (5) inches and the minimum thickness of the wearing course shall be not less than two (2) inches. When pavements twenty (20) feet or less in width are to be built on approximately level ground and a flat subgrade is to be used, sufficient fall for drainage at the sides of the pavement along the curb shall be provided by giving the roadbed the same grade as that proposed for the gutter. The crown of all pavements shall not be more than one one-hundredth (1/100) of the width, except when deemed advisable by the engineer the crown of a pavement built on a crowned subgrade may be increased to one-fiftieth (1/50) of the width to provide sufficient fall for drainage along the sides of the pavement at the curb.)

For the second paragraph under "31. Proportions," substitute the following:

A cubic yard of concrete base in place shall contain at least one and four-tenths (1.4) barrels of cement and a cubic yard of wearing course in place shall contain at least two and ninety-seven-hundredths (2.97) barrels of cement.

For the second paragraph of "33. Reinforcing," substitute the following:

Reinforcing metal shall be placed between base and wearing course and shall not be less than two (2) inches from the finished surface of the pavement and otherwise shall be placed as shown on the drawings. The reinforcing metal shall extend to within two (2) inches of all joints, but shall not cross them. Adjacent widths of fabric shall be lapped not less than four (4) inches.

Under "X. Placing Concrete," but before "34. Placing Concrete," insert the following:

A. CONCRETE FOR BASE.

PROPORTIONS.—The concrete shall be mixed in the proportions of one (1) sack of Portland cement to not more than two and a half (2½) cubic feet of fine aggregate, and not more than four (4) cubic feet of coarse aggregate, and in no case shall the volume of the fine aggregate be less than one-half (½) the volume of the coarse aggregate.

Between the second and third paragraphs of "34. Placing Concrete," insert the following:

The concrete shall be brought to a comparatively even surface, the thickness of the wearing course below the established grade of the pavement. Workmen shall not be allowed to walk on the freshly laid concrete, and if sand or dust collects on the base it shall be removed before the wearing course is applied. The reinforcing metal shall be placed upon and slightly pressed into the concrete base immediately after it is placed.

For the first paragraph of "35. Finishing," substitute the following three paragraphs:

B. CONCRETE FOR WEARING COURSE.

PROPORTIONS.—The mortar for the wearing course shall be mixed in the manner hereinbefore specified in the proportion of one (1) sack of Portland cement and not more than two (2) cubic feet of "Aggregate for Wearing Course" hereinbefore specified.

PLACING.—The wearing course shall be placed immediately after mixing and in no case shall more than forty-five (45) minutes elapse between the time that the concrete for the base has been mixed and the time the wearing course is placed.

FINISHING.—The wearing course shall be struck off by means of a template or strike board, which shall be moved longitudinally or crosswise of the pavement. Concrete adjoining the metal protection plates at transverse joints shall be dense in character, and any holes left by removing any device used in installing the metal protection plates shall be immediately filled with a mortar composed of one (1) part Portland cement to not more than two (2) parts of fine aggregate.

The specifications are accompanied by proposed sections for pavements. That for highways shows a flat subgrade and the concrete six inches thick at the edges, with the center crowned not more than one one-hundredth the width of the pavement. The outer edges of the concrete are rounded with about a three-inch radius, and a shoulder four to six feet wide protects each edge.

For a one-course street pavement the section shows a flat subgrade when the width is less than 20 feet, and a crowned subgrade where it is 20 feet or more. In each case the edges are not less than six inches thick, and the crown as specified. The wider sections are of uniform thickness and reinforced.

For a two-course pavement the subgrade is crowned. The base is not less than five inches thick, and the wearing course not less than two inches. Reinforcement is placed between the two.

ROAD IMPROVEMENTS IN BELL COUNTY, TEXAS.

District No. 5 of Bell County, Texas, comprises an area of perhaps twenty miles square, including the city of Temple and the towns of Troy and Little River, besides several small villages. Bell County is in the heart of the richest of the famous "Black Waxy" belt of Texas, and Temple is surrounded by the best of even this territory; consequently the road district is one of the richest farming communities in the country.

The roads radiate from Temple towards the boundaries of the district in six directions with a number of feeders from the cardinal roads. Northward the line runs through Troy and to the county line towards Waco, a distance of about fourteen miles. Easterly two roads lead off, one to the Falls county line northeasterly a distance of some thirteen miles, and one towards the Falls county line directly east a distance of about fourteen miles. Directly south the road leads through Little River and in connection with the road north through

Troy forms a link of the Waco-Austin road which is being projected. The other roads lead out from the city, one directly east for five miles, another south nearly paralleling the Little River road for five miles, and three of them in westerly directions.

The Commissioners estimate an expenditure of about \$400,000, covering approximately one hundred miles of road. Large quantities of very fine road gravel are to be found in the southern portion of the District and all roads are to be built of gravel. Bridges and culverts will be built of permanent material, and as far as possible the roads will be built for permanency and are being built for the future. Some sections will be concreted on account of continued overflows and difficulty in holding the high bank. Concrete bridges will be installed and high class gravel construction will prevail throughout the entire district.

In connection with the hundred miles in the Temple District, the Holland District joins at the Little River crossing on the south. The same character of work is to be done in the Holland District, which will provide for an additional fifty miles.

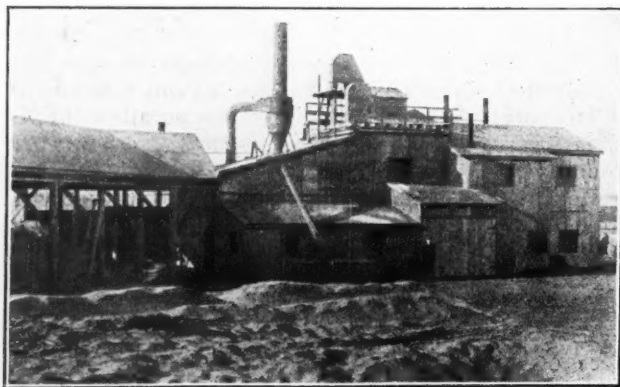
Connecting at Heidenheimer on the southeast is the Rogers District with seventy-five miles, and on the southwest the Belton District is just completing thirty miles.

It is anticipated that the Temple District, Holland District and the Rogers District will be entirely completed by the middle of next year and will represent about two hundred and fifty-five miles of permanently gravelled highways in Bell county. Including the work to be done in the city of Temple by District No. 5, the expenditure by the Commissioners' Court in the four districts—Temple, Belton, Holland and Rogers—will total \$1,055,000. E. A. Kingsley is engineer for District No. 5.

PAVING IN HAMILTON, ONT.

The annual report of A. F. Macallum, city engineer of Hamilton, Ont., for 1913, shows that during last year that city laid 745,455 square feet of cement walk at an average cost per square foot of 15.923 cents; and 59,480 lineal feet of curb at an average cost per foot of 42.338 cents. These costs do not include crossings, basin drains, moving of poles, hydrants, etc.

During the year a new asphalt plant was built in the east end of the city capable of turning out 1,500 yards per day. The city used both this and an older plant, and, the weather conditions being good, laid more asphalt pavement than during any previous year, while creosoted wood blocks and asphalt concrete pavements also were laid on a number of streets. The total amounts of pavement of various kinds laid during the year were as follows: Asphalt macadam, 38,645 square yards; asphalt on tar macadam, 9,530 square yards; asphalt on



GAGE AVE. ASPHALT PLANT, HAMILTON.

concrete, 75,018 square yards; wood block, 15,545 square yards; asphalt and wood block (relative amounts of each not stated), 80,101 square yards.

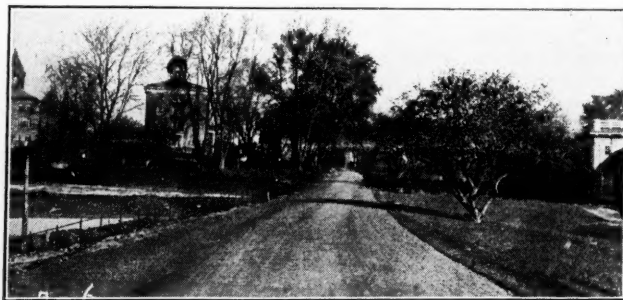
REPAIRING MACADAM IN MERCER COUNTY.

Trap Rock Road Worn Out After Twelve Years' Service—Resurfaced with Trap, with Glutrin Binder—Method of Construction.

The road officials of Mercer County, New Jersey, are at present reconstructing and repairing some of its roads in Pennington township, in general using the same kind of material as that employed in the original construction. In a large percentage of cases these roads were constructed of trap rock (which is obtained from local quarries) with glutrin as a binding material; which variety of road is in common use in that vicinity, an excellent illustration being the Washington road at Princeton. In some cases red shale and glutrin have been used and such a road examined by a representative of this paper was found to have a hard surface so well bonded together as to give a metallic ring when struck with a hammer.

The reconstruction of the Pennington road, which is now under way, is under the supervision of Daniel Klockner, road supervisor of Mercer County. A new surface is laid directly on the old one, no especial preparation of the old being made to insure a good bond between the two. The old road was laid down about twelve years ago and has since been given surface treatment with glutrin. It carries very heavy traffic, most of the product of the Pennington Trap Rock Co. being hauled over it in addition to a considerable automobile travel. It is now practically worn out under the most trying combination of traffic—heavy iron tire hauling and automobiles.

Trap rock is hauled about one mile, from the quarries of the Pennington Trap Rock Co., for use on the road.



RED SHALE AND GLUTRIN ROAD, PRINCETON.

A bottom course is laid about 1½ to 2 inches thick, 1¼-inch stone being used. This is then rolled thoroughly with a Peerless 10-ton roller. Another layer of 1¼-inch stone is spread on this and is also thoroughly rolled. A ½-inch layer of screenings is then scattered on top, wetted with glutrin diluted with 10 times its volume of water and again subjected to a thorough rolling. The road is then allowed to dry out for a short time before the final surface treatment.

Beginning with a very thin mixture, perhaps one part glutrin to twenty of water, this preparation is sprinkled over the surface, using an ordinary sprinkling cart. As fast as it is absorbed, more is applied until the road has taken up about ½ gallon of glutrin per square yard. The last application is mixed in the proportion of one part glutrin to three or four of water. The mixture is applied to the center of the road, and by absorption and capillary attraction works its way downward and sideways.

The cost of this treatment is said by the road officials



ATLANTIC CITY BOULEVARD.
Gravel Treated With Glutrin.

to be about the same as of that using oil. When properly applied, it produces a hard waterproof surface. Glutrin is a product of wood pulp manufacture, and a calcium-magnesium ligno-sulfonate, generally resembling molasses in appearance and readily soluble in water.

As stated in our issue of April 30, it has been used quite extensively on gravel roads in New Jersey, the Atlantic City Boulevard being one of the best known of these.

PAVING IN ST. PAUL.

Department Equipment and Its Cost—Cost of Asphalt Repair Plant and of Work Done by It—Brick and Stone Repairs.

In the year 1913 St. Paul, Minn., laid 3.91 miles of wood block pavement on concrete, 1.5 miles of brick on concrete, 0.46 mile of sandstone block on concrete, 0.23 mile of concrete pavement; a total of 6.10 miles with an average width of approximately 33 feet. The total amount expended for these pavements was \$385,819. In addition, 0.23 mile of brick on concrete was laid in alleys at a cost of \$6,400. A quite complete report of this work has been prepared by the commissioner of public works, Oscar Claussen, giving a great many of the details of the paving operations of the year. From this report we learn that the following unit prices for paving material were obtained by contract during the year of 1913. Sandstone blocks, \$1.65 per square yard. Brick paving blocks, \$1.05 per square yard. Creosoted yellow pine blocks, \$1.40 $\frac{7}{8}$ to \$1.46 per square yard, Portland cement \$1.48 to \$1.71 per barrel. Sand for concrete and cushion, 79 cents to \$1.25 per cubic yard. Sand in the pit, 35 cents per cubic yard. Gravel, \$1.65 per cubic yard. Crushed rock, \$1.60 to \$2.20 per cubic yard. Barrett Manufacturing Company's pitch filler, 70 cents per cwt. delivered. Asphalt filler, Standard Asphalt and Rubber Company's, \$19.90 per ton; John Baker Jr., \$19.70 per ton. Sandstone curb, 54 cents per foot for straight curb and 67 cents per foot for radius curb.

Cement and stone sidewalks were laid of various widths during the year, 1,154 lineal feet being under 6 feet in width, 11,461 feet being 6 feet wide, and 371 feet being 7 to 14 feet wide.

No new macadam or gravel streets were constructed during 1913, nor for the two years previous, on account of the adoption in 1911 of a policy of making no appropriation in the budget for road improvement, unless a part of the expense be assessed on the abutting property. Previous to that time, an average of 7 $\frac{1}{2}$ miles of roads and streets had been macadamized or graveled each year. The department has, however, done considerable work in the maintenance of old macadam and dirt streets, and also on asphalt and other paved streets. A municipal

asphalt plant was erected by F. D. Cummer & Son at a contract price of \$10,950, during 1913. A Warren portable plant, costing \$4,850, had been purchased by the department in 1912. In addition to these a considerable amount of equipment is owned by the street department and used in maintaining the 55 miles of paved streets and 65 miles of macadam and gravel streets. The equipment of the street department at the end of the year was as follows: 3 split log drags, costing \$6.65 each; 22 Studebaker and 31 Austin-Western dump wagons, costing \$116.50 to \$118 apiece; 2 Everett Manufacturing Company's dump boxes, costing \$51.65 each; 5 Studebaker flushing machines, costing from \$1-100 to \$1,300 each; 5 Charles Hvass machine sweepers, costing \$250 to \$375 each; 3 Robinson, Cary, Sands Company plows; 117 Schurmeier slush scrapers at \$5.65 each; 165 steel refuse boxes, costing \$18.50 to \$25; 50 galvanized refuse boxes, costing \$7.71 each; 30 refuse barrels, costing \$3.75 each; 48 refuse tubs, costing from \$6 to \$10 each, purchased from the Northern Cooperage Company; 25 Austin-Western road drags, costing \$10 each; 14 Glide road machines, costing \$195 each; 2 Kelly-Springfield road rollers, 1 Austin-Western roller, and two others, maker not named, costing from \$2,200 to \$3,100 each; 29 snow plows, costing from \$7 to \$10 each; 1 Austin-Western gyratory stone crusher, costing \$1,550; 1 Charles Hvass squeegee, costing \$950; 52 wheelbarrows, costing \$2.25 each, and 2 Studebaker paper wagons, costing \$45 each.

In connection with the repair plant, there is used an 8-ton steam roller, costing \$2,250; a scarifier, costing \$365; a Lutz surface heater, costing \$1,800; a fire wagon, costing \$112; 2 melting kettles, costing \$425 each; 6 2-cubic yard asphalt wagons, costing \$171.50 each; 2 18-cubic foot concrete carts, costing \$117 each; a Koehring concrete mixer No. 14, costing \$1,950; an 8-ton tandem steam roller, costing \$2,200; a No. 14 Koehring paver, costing \$1,900; a No. 15 Chain Belt paver, costing \$1,770; a No. 5 Chicago concrete mixer, costing \$481.50; and a Tinius-Olson brick tester, costing \$475. The total cost of the repair plant equipment was \$31,450.50, and as it was all comparatively new at the end of the season, its present value is assumed to be but \$200 less than this. The cost of the other apparatus used by the street department was \$33,954.25, and the present value is estimated to be \$27,980.

The repair plant was put in operation in April 25, 1912, and worked 92 days during that season. In 1913 the plant began operation on March 30, and worked 178 days during the season. During this time, 44,193.71 square yards of asphalt paving were turned out, 43,296.36 square yards of this being cut-out work, and 897.35 square yards being burner work. 16,832.42 square yards of asphalt were put in for the Barber Asphalt Paving Company, on streets under guarantee, of which 792.91 square yards were burner work and the remainder cut-out work. The company paid for this work \$21,613.34, which was credited to the repair plant. Similarly, the plant was credited with \$11,031.76 for 7,370.13 square yards of asphalt put in for the Street Railway Company, and also with \$2,340.65 paid by other public service corporations for 1,250 square yards of asphalt and 148 square yards of concrete foundation.

Repairs to asphalt pavements out of guarantee amounted to 18,487 square yards of cut-out work, and cost the city \$18,491, or almost exactly \$1 per square yard. The total area of pavements out of repair was 222,327 square yards. Of this area 8.42 per cent. was repaired, and the average cost of repairs distributed over the total area under maintenance gives 8 $\frac{1}{2}$ cents per square yard.

The operating crew at the repair plant consisted of a foreman, an engineer, a tankman, 4 laborers and a night watchman. Four teams were employed hauling asphalt from the plant to the work. The street crew consisted of a foreman, timekeeper, roller man, 2 rakers, 2 tampers, a smoother and a cement man laying new pavements, and 2 shovellers, 6 scrapers and 2 teams removing the old pavement.

The total expense of the plant is summarized as follows:

Labor at plant.....	\$5,889.02
Fuel	1,024.47
Hauling material	1,559.18
Superintendence, watchman, etc.....	3,164.21
Repairs and supplies.....	1,658.05
Material	26,876.59
Street crew labor.....	8,206.66
Hauling material to street.....	5,068.40
Engineer and watchman.....	1,391.65
Tools and repairs.....	790.05
Total	\$55,628.28

The total charge made to outside parties and to other departments for work done amounted to \$37,137.43, leaving a balance of \$18,490.95 as the cost of the city's work. As a matter of fact, the average cost of all work done was considerably more than \$1 per square yard, if we take into account the work done for private parties as well as that done at the expense of the city; the figures showing that 44,194 square yards cost \$55,628, which gives an average cost per square yard of \$1.26.

The brick and stone paving repairs during 1913 were made under the supervision of W. S. Batson by day labor, and were charged at the following rates:

	Per Sq. Yd.
Macadamized streets	\$1.50
Graveled streets	1.00
Asphalt pavements (top only).....	1.75
New brick delivered on street.....	1.25
Brick laying or relaying	1.00
New sandstone delivered on street.....	2.00
Sandstone laying or relaying.....	1.50
New granite delivered on street.....	2.25
Granite laying or relaying.....	1.75
Creosoted block 4 in., delivered.....	2.00
Creosoted block 3½ in., delivered.....	1.75
Creosoted blocks (old), relaying.....	.75
Creosoted blocks (new), laying.....	.50
Concrete foundation for all pavements.....	1.00

The total charges for the year at the above rates were distributed as follows:

Brick	\$2,408.67
Granite	875.72
Sandstone	10,945.09
Macadam repairing	797.69
Gravel	65.65
Concrete foundation	297.77
	-15,390.59

The cleaning and inspection charges are included under these prices. Of the total amount \$7,647.62 was billed against the parties making the openings in the pavement. The balance \$7,742.97 was chargeable to the city for general maintenance. This charge, however, is an apparent charge, as the actual cost of the above repair work was \$11,496.68. Conditions being favorable a profit of \$3,753.71 accrued to the department. The actual charge against the street and sewer fund was \$3,989.26 instead of \$7,742.97.

During the year the city engineer constructed about seven miles of pavement by force account, this including sandstone, creosoted wood block, brick, asphalt and concrete. The wood block was 3½ inches deep, except on work begun in 1912 which was 4 inches deep. The concrete foundation was in most cases 5 inches thick, but for one piece of work was 5½ inches and for another 6 inches. The average cost of the 5-inch concrete foundation was 63.63 cents per square yard; that of the 5½-

inch, 61.97 cents, and of the 6-inch, 69.57 cents. Preparing the roadbed averaged 28.1 cents per square yard, varying from 15.16 cents to 46.2 cents. The wearing surfaces cost per square yard as follows: Sandstone, \$2.3122; wood block, \$1.8586; brick, \$1.6016. The cost of one section of 903 square yards of concrete pavement was \$1,7366, including preparing roadbed. The total cost of the force account work of the year was \$357,181.50, plus \$31,022.69 for curbing and other incidentals.

REGULATING STORAGE OF COMBUSTIBLES

Power of Cities to Regulate Amount and Method of Storing Inflammable Materials—Ordinances Must be Reasonable and Not Discriminatory

By JOHN SIMPSON.

The enactment of ordinances aiming at the prevention of and protection against conflagration is indisputably an appropriate exercise by municipalities of the police power. The power to establish fire limits and prohibit the use of inflammable materials in the construction of buildings within such limits have been universally sustained by the courts. To what extent a municipality can control the accumulation of inflammable material upon private property within its limits is a question which has not so often been the subject of litigation.

There can be no doubt of the authority of a municipality to enact ordinances designed to prevent fires or their spread and prohibits persons from keeping upon their premises inflammable material, unless guarded and protected so far as practicable to prevent the origination of fires or from being the means of the spread of fires started in the vicinity. Such ordinances would without doubt be sustained when they are within the limits of reasonableness and do not unnecessarily invade the right of the citizen to maintain his property in the manner best conforming to the requirements of his business.

The validity of an ordinance passed by the city council of Minneapolis was recently challenged as being arbitrary and discriminatory and therefore unconstitutional and void. The ordinance provided: "No person, firm, or corporation, without a special permit therefor from the city council, shall hereafter store, pile, place, or keep upon or in any place within the city of Minneapolis, any empty or unused boxes, barrels, or other like receptacles, or any accumulation of similar inflammable materials." Under the city's charter, it was held, it might well be enacted that large quantities of inflammable material, such as old boxes, barrels, and similar articles likely to be set on fire by design or accident, be not piled or stored in any exposed place within the fire limits of the city, or the thickly settled parts thereof, or even within buildings in the congested part of the city. But to justify legislative interference with property rights in the interest of fire protection and prohibit the citizen, without special permit, from keeping upon or within his premises any particular class or kind of property, it should appear either that the property itself, by reason of its character, or the manner in which it is kept or used, is a menace to the public welfare. Legislation which goes beyond these limits and attempts to prohibit the accumulation of such material, regardless of quantity or its dangerous character, upon vacant lots or in buildings within any part of the city, including the private residences and adjacent barns and sheds, was thought by the court to exceed the rule of reasonableness. The expression "upon or in any place" necessarily included vacant lots, stores, warehouses, factories and residences, and required of each person or occupant

of any such place to obtain a special permit from the city council. It is a matter of common knowledge that almost every householder keeps stored away in the basement of his dwelling, or within a barn or shed upon his premises, old boxes, barrels, particles of wood and other like material. The quantity varies in particular cases. A large supply may be kept on hand by one and a small supply by another. A large supply either exposed or confined within a building, might be a fire menace in a particular locality, while a small supply, even though exposed, might be entirely without danger in another locality. The material so kept is ordinarily used for fuel, and is accumulated during the summer months. This does not constitute a fire menace, nor endanger the property of neighbors, nor is it likely under ordinary conditions accidentally to take fire and spread to the property of others. Nor was it reasonable to require persons living in the outskirts of the city, or at places where no danger of fire can arise from the stored material, to procure such a permit. While declaring the ordinance as it stood to be unconstitutional and void, the court said that if it could properly have been construed to exclude the private residence or the remote dweller, it might have been sustained. *State v. Wittles*, 118 Minn. 364, 136 N. W. 883 (1912).

This decision is not at variance, but rather in accord with the earlier decision in *Clark v. South Bend*, 85 Ind. 276, 44 Am. Rep. 13 (1882), where the controlling question was whether the common council of a city incorporated under the general law of Indiana had power to adopt an ordinance containing the provision, "That no person shall keep within the territorial limits of said city, on one block at a time, a quantity of straw exceeding five tons, unless the same be enclosed within a fire-proof inclosure."

It was contended that the power to prevent the accumulation of combustible materials was not expressly conferred upon the municipality. This was held to be a more narrow view of the subject than the books warrant. A municipal corporation has such powers as are expressly granted, and also such implied or incidental ones as are necessary to carry into effect the express powers and effectuate the object of the corporate existence. The court quoted a very old and quaint statement of the rule that the power to prevent danger from fire is an incidental one, belonging to all municipal corporations. It is to be found in the English law book, Bacon's Abridgment, 2,147, "So if a by-law be made in London that none shall make a hot-press, nor use it within the city, under the penalty of £10, for the making thereof, and £5 for the use thereof, this is a good by-law; because the uses of these presses is dangerous with regard to fire, and also deceitful, inasmuch as they make cloths and stuff look better to the eye than in truth they are."

With regard to the case in point the court said, "The collection in great quantities, in this case of one hundred tons, of a material so easily ignited as straw, is an act which the municipal authorities may as a matter of general welfare legislate against; and certainly it is not going beyond their powers to require that the material shall be kept within a fireproof enclosure. We are not deciding that such material in any quantity may not be brought within the limits of a city, but we do decide that the municipal authorities may make reasonable provision for its storage while within the corporate boundaries, and that requiring it to be kept in a proper enclosure is not an unreasonable exercise of the power to legislate for the welfare of the municipality."

"The ordinance is not an unreasonable one. The collection in one heap of five tons of inflammable material,

and leaving it without protection, and exposed to the danger of ignition from the acts of careless or malicious passersby, is an evil which the municipal authorities are justified in taking measures to suppress and prevent, and an ordinance enacted for the purpose of compelling a man who gathers such a quantity of material together to properly protect it, cannot justly be characterized as unreasonable."

"The ordinance is not in derogation of common right. A man has no right to collect on his own premises and leave unprotected a great quantity of combustible material. If one man may collect great quantities of inflammable material and leave it unguarded so may another, and another, and thus an entire city may be placed in peril. The truth is, there is no such thing as a common right to do, on a man's own premises or elsewhere, an act which puts in jeopardy all surrounding property."

NEW YORK MAYORS' CONFERENCE

Abstracts of Papers Read—Commission Manager Plan—Municipal Home Rule—Parks and Playgrounds—Survey for City Plan.

The business transacted by the New York State Mayors' Conference was reported in our issue of June 11, and one of the papers read—"The City Manager Plan"—was given in the issue of the previous week. We present below abstracts of four other papers and of the more important committee reports. One paper entitled "Public Health Values" we will publish later, and also the report of the Committee on Taxation. The four papers referred to we have abstracted below as follows:

COMMISSION MANAGER PLAN.

By RICHARD S. CHILDS.

There are now seventeen cities that have adopted the commission manager plan and New York cities of the second and third class are, under the optional charter law, free to assume that form of government. The commission manager plan is sound and scientific as shown by its results. Among the cities which have adopted this plan are: Dayton, O.; Sumter, S. C.; Hickory and Morganton, N. C.; Felix, Ariz.; Manistee and Cadillac, Mich.; Amarillo, Tex.; Staunton, Va., and Abilene, Kan. It was thought that nearly a dozen New York cities will adopt this form of government. At present the laws of Ohio make it available for Ohio cities also.

In Sumter, S. C., the city manager has saved his salary in one month. City managing is becoming a profession, for a well-trained and efficient manager can transfer his activities from one city to another. A good example of this is found in the case of city manager Ashburner, who formerly managed Staunton, Va., and who now occupies a similar position in Springfield, O.

NEXT STEP IN THE CAMPAIGN FOR MUNICIPAL HOME RULE.

By ROBERT S. BINKERD, Secretary, City Club of New York.

Mr. Binkerd reviewed briefly the progress which New York cities had already made toward home rule. In 1913, the Legislature passed a municipal empowering act, and in 1914 passed a law opening up to the forty-six second and third-class cities a choice among several simple workable forms of city government, any one of which may be substituted for an existing special city charter. "Under the old system each city had, through a special charter, distinct and individual relations to the state. Under the new system, all cities will have simple, general relations to the state." "It is the first time

that broad general powers have been granted to all the cities of the state." By the 1914 enactment "a single general law took the place of about twenty-five special local laws, each proposing an individual special charter for a single city."

The next step, Mr. Binkerd said, consists in obtaining for the cities the constitutional right to make their own forms of government, coupled with constitutional prohibitions which will prevent Legislatures of the future recurring to the abuses of special local legislation. The assembly passed such an amendment this year, but the Senate did not. A section of the constitution also needs amendment, the author states, in that section which regulates hours and conditions surrounding labor, since this section "is so unfortunately worded that it literally invites the Legislature to fix the wages and selection of persons employed by cities, counties and villages, which destroys the possibility of responsible financial administration." He also thinks that the Legislature ought to make immediately available an optional non-partisan municipal act which could be applied to the elections of any city by a vote of its citizens. These and other improvements in the municipal legislation of the state, he believes, will be accomplished within the next few years.

PARKS AND PLAYGROUNDS.

By CHARLES D. LAY, Former Landscape Architect, New York City.

The more extensive establishment of parks in American cities is strongly advocated. The cost of such improvements is readily offset by the increased value of the land adjoining the parks, which would augment the tax returns to the city. The sections within the city limits which lie on hills or in valleys and are therefore hardly available for building purposes, can well be reserved for parks. Also the land neighboring on streams would make purposive parks, in that they would prevent the pollution of the stream by sewage. Care must be exercised in allotting the proper amount of space for parks since too much room is wasteful and as objectionable as too little. Effort should always be made to preserve the natural beauties of a park and to maintain it as a rural park by making adequate restrictions to keep it in good condition. The improvements to be made to park territory are determined by its proposed uses. One of the most important units of a park is the playground. There should be separate playgrounds for young and older children and these should be located within a quarter mile from their homes. Athletic fields should be sufficiently large to admit of several games of baseball or football to be played at one time, and stadiums, showers, etc., can be constructed as added conveniences.

MAKING THE SURVEY FOR A CITY PLAN.

By PROF. J. S. PRAY, Harvard University.

A multitude of factors must be taken into consideration in making the survey for a city plan. Chief among these are the natural environments; humanized environments, such as housing, working and industrial conditions; existing legislation and form of government; economic and financial conditions as shown by the use of the land and taxation. Many city plans have been absolute failures largely because they ignored such facts. The main object of every city government is to make of the city a good place in which to live and work.

Data embracing the above factors should always be available and to that end a systematic survey should be made involving all city departments. Data of this kind have already been gathered by such cities as New York, Philadelphia, Newark and Jersey City. Such facts must

be kept up to date and, if necessary, the initial effort should be voluntary. However, all the work involved must be along business lines.

REPORT OF COMMITTEE ON TAXATION.

A committee on taxation was appointed by the Conference last year "for the purpose of ascertaining the problems confronting the assessors in the various cities and to recommend such changes in legislation or administration as seemed desirable." In performing this duty, the committee sent a list of 71 questions to the assessors of the 52 cities of the state and received replies from 46 of these. The questions dealt entirely with the assessment of real and personal property, and "the answers indicate that the work of the assessors in the cities of the state of New York is as good, if not better, than in any other state." The information obtained and the recommendations made are so generally informative and valuable that we expect to publish the report practically in full in a later issue.

REPORTS OF OTHER COMMITTEES.

An advisory committee of city planning experts reported that it had held a conference in New York City on December 5, 1913, which was attended by officials representing twenty-nine cities of the state. Following that, the committee endeavored to perfect plans for a city planning survey. To its surprise it learned that no attempt had ever been made in this country to draft a city planning questionnaire, and the first four months of the year was engaged in preparing such a list of questions. "As a result of this painstaking work, we believe that we now have a questionnaire that not only will serve the purpose of the committee but also will be useful to other organizations interested in city planning." Printed copies of the questionnaire were sent to the mayor of each city with a suggestion that he divide the responsibility and work of answering the questions by calling upon departments and individuals of the government who are most immediately familiar with the matter covered by each question. It is the purpose of the committee to tabulate the data as they are received, study them, and report at the next meeting.

The Advisory Committee reported that it found the expenses of the conference could not very well be cut below \$1,600 a year, and that the income was slightly less than this, and suggested as a solution of the difficulty that all or at least more of the cities of the state be induced to join the conference and contribute to its expenses. It reported that during the year the conference became identified with a movement to organize a national body composed of the secretaries of the various state organizations, and with another to hold an international congress of municipalities in connection with the Pan-American Exposition.

The Municipal Bureau Council was entrusted last year with the consideration of the establishment of a state bureau of municipal information. As twenty-six of the cities were to change mayors on January 1, little was done until that time, and it was then found that many of the new officials were not yet acquainted with the need for such a bureau and it was therefore thought wiser to delay any action until the conference of next year. Two possible plans of procedure are under consideration; one, to enlist the financial support of all the cities and establish such a bureau; the other, to seek the financial aid of individuals for three years and operate the bureau under the direction of the conference during that time, at the end of which period, the cities could decide whether or not to continue the bureau under the financial support of the conference.

Municipal Journal

Published Weekly at
50 Union Square (Fourth Ave. and 17th St.), New York
By Municipal Journal and Engineer, Inc.
Telephone, 2805 Stuyvesant, New York
Western Office 608 S. Dearborn Street, Chicago

S. W. HUME, President
J. T. MORRIS, Treas. and Mgr. A. PRESCOTT FOLWELL, Secretary
C. A. DICKENS, Western Manager
A. PRESCOTT FOLWELL, Editor

Subscription Rates
United States and possessions, Mexico, Cuba.....\$3.00 per year
All other countries..... 4.00 per year
Entered as second-class matter, January 3, 1906, at the Post Office at New York, N. Y., under the Act of Congress of March 3, 1879.

CHANGE OF ADDRESS

Subscribers are requested to notify us of changes of address, giving both old and new addresses.

Contributions suitable for this paper either in the form of special articles or of letters discussing municipal matters, are invited and paid for.

Subscribers desiring information concerning municipal matters are requested to call upon MUNICIPAL JOURNAL, which has unusual facilities for furnishing the same, and will do so gladly and without cost.

JUNE 25, 1914.

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Concrete Road Specifications.

The specifications for concrete pavements printed elsewhere in this issue have as their sponsors men high in the profession of road engineering and presumably present the best practice as developed by experience up to the present time. Several definite recommendations are made as to details of both designing and construction methods.

A crown of one one-hundredth of the roadway width on country highways and one-seventieth in cities is recommended as maximum. This is about standard practice for fairly smooth pavements generally.

For pavements 20 feet wide or less it is recommended that the subgrade be made flat, and the concrete be thicker in the middle than at the edges by the amount of the crown. This, while not a novelty, had not, we believe, been generally adopted by engineers. The same may be said of reinforcement, which the conference recommends for all pavements more than 20 feet wide, "to distribute the effect of expansion and contraction due to temperature changes and moisture content of the concrete, as well as the weight of traffic over defects in the subgrade." The use of reinforcement in the past

has been relatively infrequent, and the adoption of it will add appreciably to the cost of concrete pavements. Apparently it is recommended for practically all city pavements of concrete.

Joints are recommended at intervals of about 35 feet. Apparently it is not considered practicable to distribute the expansion and contraction throughout the roadway by reinforcement, in spite of the recognized trouble caused by joints. Protection plates for joints are called for, and joint filler about $\frac{1}{4}$ of an inch thick.

Even more important in its effect on the quality and cost of concrete pavements is the specifying of a one-two-three mix and a less wet consistency than is often employed, the latter adding to the cost of distributing and the former to the cost of cement. There can be no question, as we have previously pointed out, that much pavement concrete is mixed altogether too wet.

Altogether, these specifications seem adapted to securing a high grade of concrete pavement and by no means a cheap one. Such a pavement is not the mere equivalent of an ordinary foundation for a brick or asphalt surface; and if it is the idea (as is sometimes the case) to use it as a wearing surface for a year or two only and then cover it with sheet asphalt, bituminous macadam, brick, etc., we doubt if it would be found economical to build as high grade a concrete pavement for such purpose.

Municipal Reports.

The Springfield, Mass., Bureau of Municipal Research is endeavoring to bring about a reform in the city's "municipal register" or volume of annual reports, and the leaflet which it has issued and distributed to the citizens contains suggestions which would be pertinent in many other cities. The 1913 report contained 1194 pages, of which the bureau thinks 590 might have been omitted to advantage; among the eliminable matters being the location of all fire hydrants, location of all water mains and sewers, list of all city officials since 1852, etc.

This matter of annual reports is in a most unsatisfactory condition in a great many cities. Few reports, appear to have been planned and compiled by any individual acting as editor, but generally give the impression of containing a number of reports each of which was prepared without any relation to the others and of a length determined by the ability of the author to write rather than by the amount or importance of the information he has to impart.

An inventory of every hammer, shovel, horse shoe, etc., possessed by each department is desirable to have, but not to publish in such a report. Similarly fire hydrants, sections of each size of sewer, itemized expenditures for stationery—all should be on record, but they have no place in an annual report. There may be an excuse for a list of locations of fire alarm boxes, but even such a list might better be printed on a separate card and distributed to the citizens.

A municipal report, to our mind, should be a statement by the head of each department to the taxpayers telling them exactly but concisely what has been accomplished by his department during the year, how much it cost and in what condition the affairs of the department now stand; with recommendations for the coming year (if it has not already passed before the report is published). This report may be made in form to the mayor or council, but in reality it should be to the citizens, and should be written with that idea in mind. It should not be assumed that the citizens will or should constitute an auditing committee of the whole, that they want to know just where every piece of water pipe, valve, etc., is located. If they do, the books

of the department are the proper place to find such information.

On the other hand, the report should contain sufficient details to permit the citizens to learn the more important unit costs of work done. The description this week of paving work in St. Paul was obtained from such data in the annual report of the commissioner of public works. Brief descriptions of important or striking pieces of work might also be given.

To what extent information for the benefit of officials in other cities and more or less technical in nature should be included in annual reports is debatable. The practice of doing so and exchanging reports often disseminates valuable information, and we are sure that in the long run municipal officials profit by information so obtained, and through them the taxpayers, to a saving in cost or increase in efficiency having a value of many times the total cost of publishing such matter. Moreover, an ever increasing proportion of intelligent citizens are acquiring a more or less intimate acquaintance with such matters, and for these at least this class of information aids toward the general end of informing them concerning the doings of the department. Personally, therefore, we would favor including concise descriptions of this kind in municipal reports.

Ancient history has no place in annual reports, except for occasional comparisons to demonstrate progress. In too many cases the entire report is ancient history before it appears. It should be pushed through within three months—before the active spring work begins, in those cities where the fiscal year ends in December.

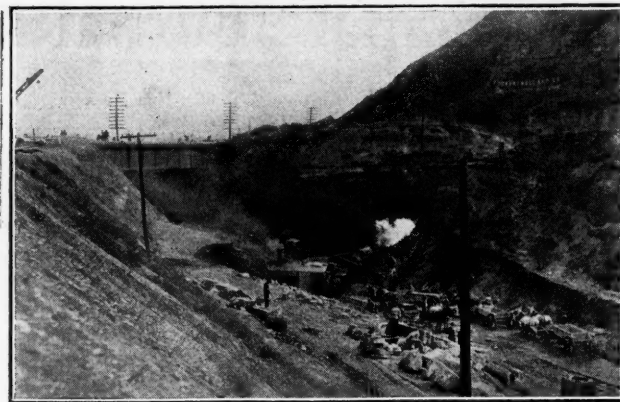
A TUNNEL STREET IN PITTSBURGH.

The city of Pittsburgh has found it desirable to drive a tunnel in order to connect two of the principal arteries of the city, Chartiers avenue and West Carson street, which tunnel will offer an important connection between Sheraden and the boroughs of Ingram, Crafton, Idlewood, Carnegie and other points west and north of the city. In addition to providing a safer and more direct street car route connecting these districts, this tunnel will offer a passage for vehicles which will save a mile of difficult and even dangerous travel. This work is now under construction, and it is hoped to complete it by the end of the year.

At present the work under way is that of making a cut of about 60 feet under two railroad lines, in which is to be placed a concrete tunnel nearly 450 feet long. Two steam shovels are at work at each end of this cut. At one point the tunnel will pass under the Ohio Connecting Railroad tracks where these are in turn under the tracks of the Panhandle road. The contract for the work was let last year to the M. O'Herron Company



TRACKS UNDER WHICH TUNNEL IS BEING RUN.



WORK AT ONE ENTRANCE TO TUNNEL.

for \$180,000, of which amount the Pittsburgh Railways Company will pay \$20,000. The inside height of the tunnel will be 21 feet and the clear width 41 feet. It will contain two street railroad tracks, with a roadway on either side of these, and a 6-foot sidewalk. The roadways will be paved with brick, and the walls of the tunnel will be lined with brick for 9 feet from the ground and concrete for the rest of the way. It will be lighted with incandescent lamps. Beyond the tunnel will be an open cut 210 feet in length, the side of which will be supported by a retaining wall 31 feet high at the portal and tapering to 6 feet at the outer end. The excavation through the railroad embankment is being made in cut and the tracks carried over it on steel girders; but when the excavation and concrete tunnel have been completed, the latter will be filled over to the level of the tracks and the girders removed.

STREET WORK IN NEW BEDFORD.

During 1913 the city of New Bedford laid 81,757 square yards of macadam, using 28,615 tons of stone, or .35 ton of stone per square yard, the cost of this work averaging 54 cents per square yard. Rebuilding of macadam roads was conducted to the extent of 114,920 square yards, and in this work 26,432 tons of stone were used, or .23 ton per square yard, the cost per square yard being 38 cents. The cost for new macadam during the past six years has been 54, 54, 52.9, 51.8, 60.3 and 54 cents for the successive years respectively.

Bitulithic laid during the year, totaling 9,635 square yards, cost \$2.74 per square yard, including grading. In 1912 the cost was \$2.53, in 1911 \$2.44 and in 1910 \$2.956. Endurite was first laid in 1912, 19,377 square yards being laid at a cost of \$1.63 per square yard. Last year 16,251 square yards were laid at a cost of \$2.05 per square yard, including grading. Granite block (Hassam system) on concrete foundation was laid to the extent of 16,203 square yards, more than had ever previously been laid. The cost per square yard was \$3.56. The costs in previous years had been \$3.574 in 1912, \$3.51 in 1911, \$3.684 in 1910, \$3.85 in 1909 and \$3.713 in 1908.

Curbing cost 55 cents per foot for the stone and 47 cents per foot for labor, a total of \$1.02.

The city operates three permanent crushers and one portable crusher, and these crushed 73,830 tons during the year at an average cost per ton of \$1.061.

During the year 12,616 square yards of granolithic sidewalk were laid at a total cost of \$9,559 for labor of preparing the foundation and \$10,604 for laying the concrete, giving a total average cost per square yard of \$1.59.

The above items are taken from the annual report of C. F. Lawton, superintendent of streets, in which report each piece of paving or other construction work is itemized.

The WEEK'S NEWS

New York State Highway Contracts—Sixteen Thousand Miles for Illinois—Sanitary Education Campaign in New York City—Sewerage Investigations in Milwaukee and Kansas Cities—Denver Water Supply—Water Waste Again—Three-Cent Light Successful—The Salem Fire—City Charters.

ROADS AND PAVEMENTS

Commissioner Carlisle's Orders Not Reviewable.

Albany, N. Y.—A determination by the State Commissioner of Highways cancelling a contract for the construction of an improved highway is not reviewable by the courts of this State. If the contractor has suffered any loss as the result of the Commissioner's ruling his redress is to go to the State Board of Claims for damages. These principles have been laid down by the Court of Appeals in a test action begun by the Standard Bitulithic Company, which attempted to review by a writ of certiorari the decision of State Highway Commissioner John N. Carlisle, revoking a contract for the construction of the Smithtown-Port Jefferson highway in Suffolk County at a cost of about \$225,000. This contract was awarded by the Dix Highway Commission and called for the use of certain patented road materials. Mr. Carlisle had cancelled the contract. Over \$1,000,000 of cancelled contracts for other patented materials are involved.

Highway Work in Brooklyn.

Brooklyn, N. Y.—Repair and reconstruction work is being pushed rapidly on several leading highways of Queens, some of them with the regular force of the Highway Department. One of the biggest jobs is repairing with old granite blocks which are split and relaid with cement joints. The improvement extends from curb to curb and the distance is three miles. The work is being done under four separate contracts: The Eon Engineering and Contracting Company for \$178,743.80, Charles Ruckelwaldt for \$30,348.50; two jobs, Newman & Carey, for \$25,290.36 and \$20,801.80. The total cost of the city's portion of the improvement of the entire highway as above detailed is \$255,184.46. In addition to the above the Brooklyn Rapid Transit Railway is to lay a similar new pavement between its car tracks for the entire distance.

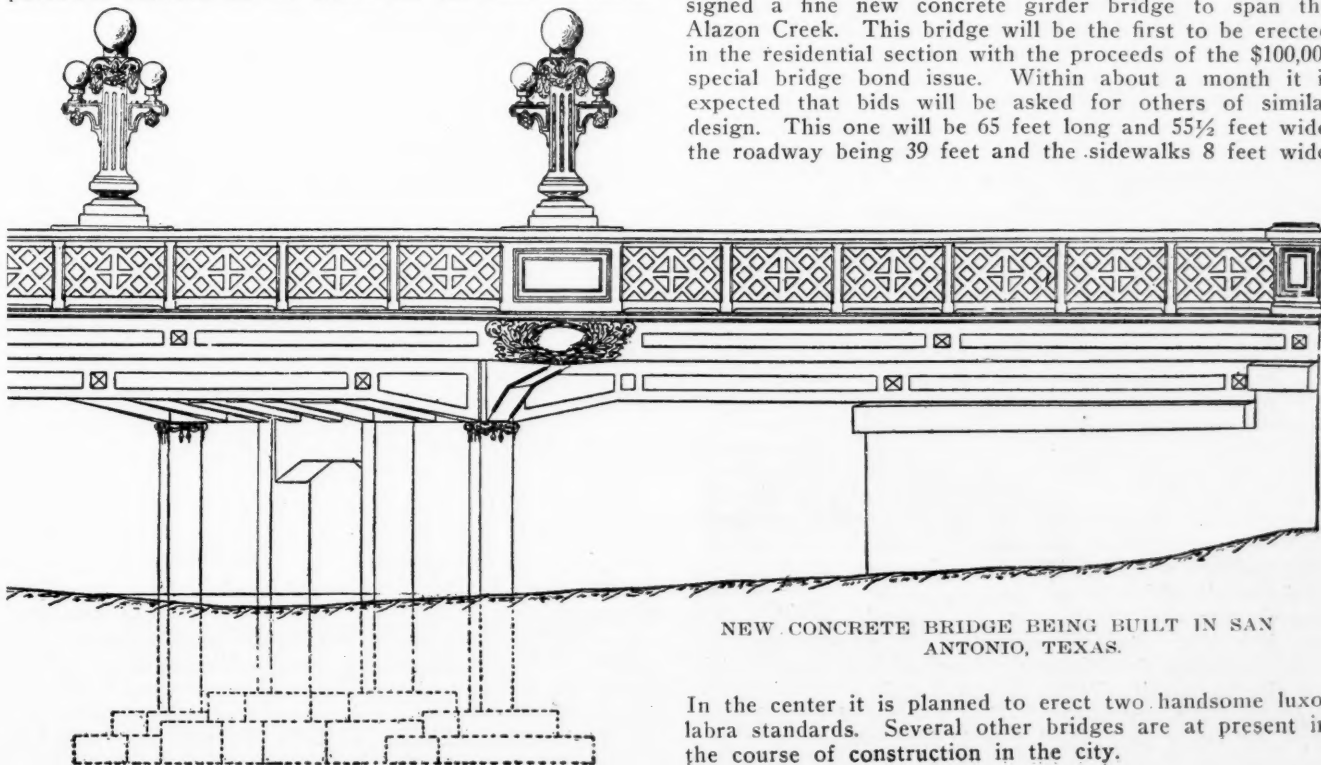
It is expected to have the entire work completed by fall if not delayed by the railroad company. Another big undertaking being pushed is repairing with the same kind of granite blocks as the above-named and with cement joints by Joseph Rosenthal for \$87,419.60. Other big contracts are the paving with bitulithic cement of several streets in College Park by the city from its repairing fund. This work was held up for many months pending a determination by the city laws department as to whether it should be paid for by the city or assessment upon private property owners benefited by the improvement. It was shown that the original pavement had been laid by the local owners, hence the repairing was paid for by the city. The Cleveland-Trinidad Paving Company has contracts amounting to \$85,003. The Standard Bitulithic Company has contracts totaling \$1,433.62. One avenue is being repaired with bitulithic macadam pavement by the highway department's own force. The length is about a mile and a half, of which 2,301 feet is done. The highway force is also repairing avenues with wood blocks and bitulithic macadam. It is said that the work being done by the city's employees is fully up to the standard of that of the best asphalt companies.

Investigating Binders.

Bristol, Tenn.—W. D. Lyon and W. D. Roller, of the Sullivan County Road Commission, and S. G. Keller, Jr., Commissioner of Public Affairs of Bristol, Tenn., are touring the middle western states to investigate artificial binders for macadamizing roads to select another method of binding. The old water method has been used in the roads that have been built thus far.

New Bridge Designed for San Antonio.

San Antonio, Tex.—A. N. Nicoloyson, Bridge Engineer, under the supervision of City Engineer Helland, has designed a fine new concrete girder bridge to span the Alazon Creek. This bridge will be the first to be erected in the residential section with the proceeds of the \$100,000 special bridge bond issue. Within about a month it is expected that bids will be asked for others of similar design. This one will be 65 feet long and 55½ feet wide, the roadway being 39 feet and the sidewalks 8 feet wide.



NEW CONCRETE BRIDGE BEING BUILT IN SAN ANTONIO, TEXAS.

In the center it is planned to erect two handsome luxolabra standards. Several other bridges are at present in the course of construction in the city.

New York State Contract Cancelled.

Binghamton, N. Y.—Owing to the fact that the authorities of the village of Union will not guarantee the share of the Binghamton Railway Company of the cost of the proposed brick pavement on Main and Bridge streets in the village, the State Highway Department will cancel the contract. This contract was let last spring to A. D. Osborne of this city, the cost of the proposed construction being about \$15,000. The strip which the State proposed to improve is about one-half mile in length. The State proposed to construct a 16-foot pavement here, and notwithstanding the refusal of the village authorities would go on with the work, if the village portion could be constructed between the street line on one side and the railway track on the other. This portion of the road is less than 16 feet wide, however, and to build the pavement would require several feet of the portion of the highway occupied by the railway company. The entire width of the portion of the road which would be paved is about 25 feet. The State requires a village to guarantee the payment of the share of the cost of pavement construction to be assumed by a public service corporation. It was said by the village authorities that the railway company claimed it could not be compelled to pay any paving cost, owing to the existence of an exemption in its franchise. Under these conditions the village authorities claimed that the taxpayers of the village were not in sympathy with the guarantee provision, and notified the State Highway Department to this effect. Therefore the contract will be cancelled, Division Engineer Howard E. Smith said.

Road Law Upheld Assures 16,000 Miles.

Springfield, Ill.—Sixteen thousand miles of paved country roads, half of the expense of which will be paid by the State, are now finally assured the Illinois Supreme Court having upheld the constitutionality of the Tice good roads law. Specifications have been completed in thirty-eight counties and work will begin early in July, according to A. D. Gash, president of the Illinois Highway Commission. He estimates that 180 miles of concrete or brick roads will be built immediately in sixty counties. \$1,000,000 was appropriated by the last legislature. The law provides that all road building shall be under one system. Superintendents are to be appointed in every county. The law contemplates a total of 98,000 miles of roads. The state is to pay half the expenses of constructing 16,000 miles. The chief source of revenue will be the automobile license taxes. The case came to the Supreme Court from the Circuit Court of Sangamon County, where Jacob Martins, of McLean County, asked an injunction to prevent State Auditor Brady from paying out state road fund money. Advocates of the law have cited statistics to show that Illinois has ranked second in its road improvement expenditure and twenty-third in actual good roads.

Alabama's Three Years of Road building.

Montgomery, Ala.—In the annual report for the fiscal year ending March 31, 1914, of the State Highway Commission, State Highway Engineer W. S. Keller shows that 1,992 miles of good roads have been built during the last three years. Of this amount 226 miles was constructed through the aid of the state and under the direct supervision of the state highway department. Only seven counties last year failed to take the state aid money.

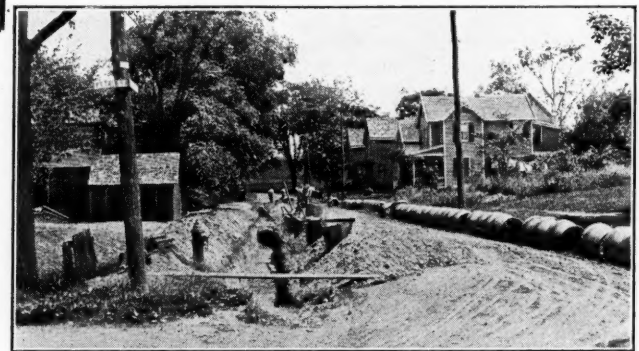
Charlotte's Street Maintenance Plans.

Charlotte, N. C.—With the expiration of five-year guarantee maintenance contracts on 42,000 square yards of permanent paving, the city is facing the problem of street maintenance. Tarvia B is to be used as a street restorative, and good results are expected. Samuel H. Lea, city engineer and superintendent of streets, is in charge of the work, which is already under way. City Engineer Lea expects to keep the streets in good condition at a very low cost. With the regular street force laying 1,200 to 2,000 yards a day, the entire work will be completed in less than a month. Tarvia B has already been tried here in front of the city hall and other places and Superintendent Lea is very well satisfied with the results.

SEWERAGE AND SANITATION

New York's Sanitary Education Campaign.

New York, N. Y.—Mayor Mitchel's policy of having the municipal departments co-operate to improve the conditions of city life will be carried out in a campaign just started by the Tenement House Department and the Tenement House Committee of the Charity Organization Society, to educate tenement house dwellers to the advantages of social work, and to guide them in making their homes more comfortable and sanitary. Under the approval of the Mayor an educational pamphlet has been issued, which Commissioner John J. Murphy, of the Tenement House Department, will cause to be distributed by his inspectors to every family of tenement dwellers in the five boroughs. The publication, however, is merely an adjunct to the general campaign of social service, as it is intended to send women inspectors to the mother of every family to explain why the book is issued and to point out how its suggestions, if followed, will help her and her family. In this way other features of social conditions that may not be provided for in the publication will be brought up for practical consideration and im-



Courtesy Newburgh (N. Y.) News.

LAYING NEW BEACON SEWER.

mediate helpful aid given through these personal interviews. For the present the work is to be carried on only in districts where the need in the summer months is greatest, that is, the districts where there is the most congestion. The start has been made by women inspectors in two or three districts on the lower east side, one on the upper west side, and two on the west side. The pamphlet, printed in large type, with illustrations, and neatly bound in a purple cover, bears these words on the front cover: "For you. It is hard to get money. It is harder to spend it right. Health is wealth." A long list of rules for general cleanliness are thoroughly explained. The tenants are told to complain if conditions are wrong to the janitor, and if the complaints are not met promptly to write to the landlord. A list of things of which the tenant has a legal right to complain is given. The book contains a photograph of a tenement house inspector in uniform, with a facsimile of his official badge, and the tenants are told that he is paid to help them. It is expected that both tenants and owners will be glad of the work.

Sewer Improvement in Beacon, N. Y.

Beacon, N. Y.—A large force is at work laying a new sewer through Franklyn avenue. The pipe is already on the spot and work is progressing rapidly. The illustration shows the trenching and the pipe.

Milwaukee Sewerage Investigation.

Milwaukee, Wis.—One of the many problems that face the sewerage commission is the clarifying of the streams which pass through the city, and at the laboratory which has been erected on Jones Island, experiments and tests are now being made by the waters of the rivers and creeks for the purpose of determining what is needed to purify the waters and to eliminate disease possibilities. It is possible that at a future date the commission may recommend that Kinnickinnic creek be diverted to an under-

ground sewer in that section of the city, where it is but a small stream and has been for years one of the problems with which the health authorities have struggled. Chief Engineer Hatton said that the commission had made no plans for the disposition of the creek as yet, but that he was of the opinion that at least a part of it could be placed underground and the wide section which it now occupies could be filled and converted to residential and commercial purposes. Surveyors and draftsmen are making a survey of the entire city's needs of intercepting sewers, which will be a part of the great system which the commission is projecting. Chemists are taking water from the Milwaukee river at different points, from the Menomonee as far west as Wauwatosa and of the Kinnickinnic as far west as West Allis. Tests are also being made by the chemists of the wastes from the large manufacturing plants to learn the nature of the matter and solve the problems of their digestion and disposal. The testing station for which the commission recently contracted for with the Frank Luenzmand Company, is under construction on Jones Island. There will be a series of buildings and settling tanks of a temporary nature costing \$23,446. Here will be made the experiments of seven different processes of sewage disposal that are now in general use, and the commission is also contemplating some experiments with electricity for sewage sterilizing, a plan that is now being tried out in New York.

Hetch-Hetchy Valley Mosquito Extermination.

San Francisco, Cal.—According to City Engineer O'Shaughnessy, the Hetch-Hetchy Valley is infested by mosquitos, from little lakes and pools caused by the melting snow and the river overflow. The improvements to be made in connection with the construction of the San Francisco water supply system will do away with the mosquitos and other discomforts, O'Shaughnessy says. The road from Hog Ranch to Hetch-Hetchy will be eight and a half miles long, and will cost about \$150,000, he says. It will be twenty-two feet wide and will carry railway tracks later. Bad bends and bridges on the road between Groveland and Hog Ranch are being improved by the city's workmen, so that easy hauling may be done by truck or team to the new road. When the new road is built active operations on the construction of the Hetch-Hetchy dam will be commenced.

Sewer Extension Work Nearly Completed.

Austin, Tex.—Austin's sewer system is practically complete, so far as it can be completed with the proceeds of the \$250,000 bond issue voted for the purpose. The laying of a cast iron pipe under the bed of the Colorado River to convey the sewage of South Austin to a junction with the big Holly Street main is about all, aside from laterals, that remains to be done. The report of the city engineer on this subject for the month of May shows that up to the end of the month 188,835 linear feet or 35¾ miles of sewer main of all sizes had been laid, at a cost of \$188,126, exclusive of engineering and supervision. All contracts had been completed.

War on Untreated Sewage.

Topeka, Kan.—War on the emptying of untreated sewage into Kansas streams from which cities lower down obtain their water supply, has been begun by the state board of health. Three state sanitary engineers, in charge of S. J. Haskins, state sanitary engineer, were ordered out with instructions to close and seal all sewers opening into streams for the disposal of untreated sewage. Numerous complaints have been filed with the board that the water supplies of various cities are being contaminated by cities up-stream dumping untreated sewage into the streams. The latest complaint filed was by the City of Augusta against El Dorado, the latter city being accused of polluting the Augusta water supply by dumping sewage into the Walnut River. Engineer Haskins and his deputies also have been instructed to close and seal all sources of water supply to municipalities where the sources have not been approved by the board. These seals shall not be broken, and no water used from these sources of sup-

ply, except in case of serious conflagration. In case of conflagration the board must be notified immediately if the condemned water supply is opened up. There is a state law providing a heavy penalty for the use of water from supplies not approved of by the board. This law has not been invoked so far, but J. S. Crumbine, secretary of the board, declares that hereafter any city supplying impure water will run the risk of being haled into court.

WATER SUPPLY

No Water Free List.

Orange, N. J.—Important changes in the rules and regulations of the Orange water department are made in an ordinance just passed on first reading by the city commissioners. A minimum charge of \$5 a year for each service connection is provided, and all institutions which have been allowed free water service heretofore will be charged at the regular meter rates. Commissioner Harry D. Wethling, director of streets and public improvements, who introduced the ordinance, announced that the reduction for a minimum charge will increase the revenue about \$1,300 a year. In the past the semi-annual water bills for some houses have been less than \$1, but under the new rule the charge for six months cannot be less than \$2.50. Mr. Wethling stated that about 700 consumers will be affected by the minimum rate rule. The provision for charging public buildings and institutions at meter rates was inserted as an amendment on the suggestion of Commissioner William A. Calhoun. This rule will affect hospitals, public and private schools, churches, fire department and other public buildings, the public bath, and charitable institutions. Mr. Wethling estimated that the consumption of water in these buildings amounts to about \$6,000 a year, and he pointed out that the new rule would make it possible to determine the actual revenue of the department. If enforcement of this rule proves a hardship, it was pointed out, a direct appropriation for the various institutions might be necessary in the general tax budget.

Broken Main—No Water.

Fort Collins, Colo.—Fort Collins was without a drop of water for a day, as a result of the breaking of the big water main supplying the city. The break occurred at a point eight miles from the city in the mountains just below the reservoir. The situation caused grave danger when a fire was discovered in one of the residences. A chemical engine put out the blaze. With the hydrants absolutely dry, a serious fire would cause great damage.

Threatens to Seize Water Plant.

Denver, Colo.—The Denver City Water Company is trying to prevent the city from building its own plant, but has so far lost almost every legal fight. It is now trying to sell the plant to the city. The city is willing to buy, but the officials insist that the figures are too high. To complicate matters the plant broke down in the last few days. For several days portions of the city were without water and at the mercy of fire. Two conduits gave way, and investigation showed that they were worn out. Temporary repairs have restored an almost normal supply, but the opponents of the company say that the weakness of the plant has been exposed. The voters are opposed to the water company's scheme to sell out to the city, and the city commissioners are supporting the public. Public opinion was disclosed last February at a referendum election, when the taxpayers, by a vote of more than 2 to 1, decided to buy or build a municipal water plant, and voted a bond issue of \$8,000,000 for the purpose. It is estimated that if the city should buy the old plant for \$8,000,000, or a lower price, \$3,000,000 additional would have to be spent to put the plant in fair shape. A new municipal plant can be built for about \$9,000,000. "If the water company isn't giving the city the service it should give, or if it uses any extreme methods, such as cutting off water on the people who are unable to pay for service six months in advance, then we shall exercise the police power imposed in this city and take such steps as may be necessary

until the service is restored and the water company employs reasonable methods in the collection of its rates," said City Attorney I. N. Stevens. Finally, by unanimous vote the city commissioners recently agreed to extend indefinitely the provisions of the resolution providing for seizure of the company's plant if its service shall at any time be adjudged insufficient for the city's needs. This decision was reached after Commissioners Nisbet and Thum had declared they believed the company was supplying the city with all the water possible with its present plant. The adoption of this resolution means that no action will be taken at this time by the city to interfere with the water company. It means also that the water company must maintain the present standard of service or risk action looking toward taking control of its system out of its hands.

More Water Waste Figures.

Woodbury, N. J.—According to Water Superintendent Ford the taxpayers will soon be called on to pay a bill for a new pump at the waterworks, new and larger mains to the reservoir, besides the enlargement of the present reservoir, or an additional one. Just at this time artesian wells are being driven for a new supply at a cost of about \$25,000, and it looks as though the water problem will be an expensive one. The reservoir now used holds a million and a quarter gallons of water, and just about that amount is now being consumed each twenty-four hours. Pumps are continually going, and in case of a breakdown in either, as occurred recently, a shortage is bound to occur.

Wilmington, Del.—At the meeting of the Water Commission President Poole drew attention to the enormous amount of water that had been pumped during the week. According to Chief Engineer Hoopes 87,003,040 gallons of water had gone through the city mains last week. Mr. Poole complained that every one with a lawn is keeping the sprinkler going—in some cases all night. He said that the law restricting waste is not enforced so long as the water in the reservoir is not run down. He asked that the people be careful in the use of water.

Indianapolis, Ind.—Frank C. Jordan, secretary of the Indianapolis Water Company, declared that the officers and employes of the company are making conscientious efforts to provide an efficient and satisfactory water service for the city but that the citizens are not co-operating. The primary object of the water company, said Mr. Jordan, is to provide protection to the city in case of fire. Because of this, he contended, the patrons should co-operate with the company in conserving its resources rather than wasting them. Mr. Jordan deplored the fact that water should be allowed to run needlessly all night when there is a possibility of an emergency and the need of high pressure to combat a fire.

Piqua, O.—The Water Works Department reports that the daily consumption of water in Piqua for some time past has averaged 5,000,000 gallons. The normal daily consumption is 2,500,000 gallons. This excessive use of water is giving the department not a little concern. It represents the maximum capacity of the plant. If maintained much longer it threatens to cause a water famine because of having exhausted the reserve supply. The situation imperatively calls for moderation and restraint in the use of water. A number of offenders have been before Mayor Lorimer, who has warned them to desist. Others will be called.

Dallas Water Plant Valuation.

Dallas, Tex.—The inventory of the Dallas water department this year will show an increase of approximately \$300,000 over the figures representing the value of the city's water system last year, according to an estimate made by City Water Commissioner R. R. Nelms. The inventory of this department is based on the actual cost to the city of the water works. During the year the filtration plant has been constructed at a cost of \$230,000, the Oak Cliff pumping station has been built at a cost of \$35,000 and various items of machinery have been added. The value placed on the water works last year was \$3,748,000 and the additional equipment this year will bring the value up to more than \$4,000,000.

Suing City for Flooded Property.

Pasadena, Cal.—Claiming \$72,300 damages by reason of the construction of the Rubio and northeast storm drains in Pasadena, the San Gabriel Valley Country Club has presented a formal demand upon the city for this amount. The demand undoubtedly will be denied. The form taken in making the demand indicates that the club will bring suit, basing its claim on the ground that by carrying the water through conduits instead of allowing it to spread over the surface of the city, the city has hurled upon the club property a flood which, under natural conditions, would never have reached there. The point involved is one which will have to be settled in many localities. The question is whether a community on higher land has a right to carry away flood waters through its district when they would otherwise run out over a large acreage and be at least partly absorbed. With paved streets feeding into storm drains and hundreds of acres covered with buildings which absorb no water, the run-off of floods increases with the population. The issue of responsibility is largely undetermined. This particular case becomes even more complicated through the fact that the ditches run both inside and outside of Pasadena. The Rubio drain was built by the county, though much of the district is within the city, but the east side drain was built entirely by and under the direction of the Pasadena authorities.

Meter System for Conservation in Cherokee.

Cherokee, Kan.—The city officials have started the city water system on a meter basis, beginning the first of July. Mayor Iliff said that citizens had used 45,000 gallons of water in one night. It is his opinion that many sprinkled lawns and gardens until late into the night. The mayor said that metering would begin a saving program and people would pay for what they use.

Install 3,000,000-Gallon Pumping Engine.

Lebanon, Pa.—Extensive improvements are being made at the Jamestown pumping plant of the Lebanon Valley Water Supply Company. A force of twelve men are now at work installing a 95-ton three million gallon compound pump. This gives the company power to pump six million gallons of water daily into the Sand Hill reservoir, one miles north of this city, from where it is distributed to all sections of the valley. The new engine was made by the National Transit Company, Oil City, Pa. An air compressor and a new filtration plant are also being installed.

STREET LIGHTING AND POWER

5,000 Candle-Power Lamps.

New York, N. Y.—During the Fourth of July celebration incandescent electric lamps of 5,000 candle-power each, the most powerful ever made, will be used for illuminating some of the parks. They have been furnished by the New York Edison Company. They will be placed on the top of poles 25 feet high; 2,000 candle-power lamps will also be placed in the various parks.

Three-Cent Light a Success.

Cleveland, O.—Municipal ownership of the electric light plant is proving a success at 3 cents a kilowatt hour for lighting. Light Commissioner Ballard states that the 3-cent rate offered by the municipal plant since May 1 of this year is proving highly profitable, both to the public and to the city. "There has been a steady increase of more than 100 customers a month since January 1," said Ballard, "and 3-cent light will draw 200 new users to the municipal plant this month. This year's business shows a big increase of light users, amount of current generated and profits made by the city." Total revenue this year up to May 1 from the Brooklyn and Division plants, \$81,919; operating and maintenance cost, \$46,416; 3,639,280 kilowatt hours were generated by the municipal plants this year up to May 1, and 2,073,471 sold. The average sale price a kilowatt hour was 2.83 cents, while the average cost price was only 1.61 cents a kilowatt hour, an average profit a kilowatt hour of 1.22 cents. Only 1,570,411 kilowatt hours was sold Cleveland consumers last year from municipal

plants up to May 1. This year 2,896,648 was sold in the same period. Street lighting for the first four months last year brought in \$20,251. Four months this year have netted \$22,839. Commercial lighting bills for the same time last year totaled \$27,196. This year they were \$34,705. Power users have made the biggest boost in the municipal consumption. Power bills up to May 1 last year came to \$9,719. This year they have climbed to \$24,015. Light plant officials put \$29,610 in extensions and improvements in four months last year. This year they have spent only \$11,634. Profits are being put in a cash reserve to finance the new plant at the start.

Municipal Gas Works Profitable.

Belfast, Ireland.—During the fiscal year ended March 31, 1913, the municipal gas works made 2,480,628,000 cubic feet of gas, of which 1,389,231,000 cubic feet were coal gas and 1,091,397,000 cubic feet water gas. This was an increase of 142,105,000 cubic feet over 1911-12. The cost of producing gas in 1912-13 was \$616,219, against \$633,933 in 1911-12, and the receipts from sales were \$1,024,113 in 1912-13, against \$971,383 in 1911-12. From the profits, \$54,406 in 1913 and \$54,263 in 1912 were contributed to the sinking fund of the city hall. In addition a grant of \$48,665 was made each year in aid of city taxes. The present selling price of gas is 2s 3d (54.7 cents) per thousand cubic feet, with a discount of 20 per cent. for payment within one month from date the account is furnished.

FIRE AND POLICE

Loss of Millions in Salem Fire.

Salem, Mass.—Estimates of the devastation done by the huge fire which raged through half of Salem vary at present from \$5,000,000 to \$7,000,000. For hours the firemen were helpless. Block after block was dynamited, but the fire, checked in one direction was driven by shifting winds to another. The fire started at two o'clock in the afternoon and not until eleven had the area of conflagration reached the limit. It began as the result of an explosion in a leather factory and spread quickly over historic and manufacturing sections of the old town. The burned buildings include the plants of a score of manufacturing companies, among them the big factory of the Naumkeag Cotton Mills, twice as many business places, St. Joseph's Roman Catholic Church, recently erected at a cost of a quarter of a million of dollars, the Orphan Asylum, and more than 200 residences and tenement buildings. The entire section occupied by the Italian and Greek colonies was devastated. Most of the 2,000 persons who had homes in that district were housed temporarily at the Y. M. C. A. building, the state armory, police stations and other public buildings. All roads leading out of the city were crowded with refugees on foot, in automobiles and all sorts of conveyances. Many carried all they had saved of their household possessions wrapped in sheets and shawls over their shoulders. At the start the water pressure was available but when the fight had become harder a great water main near the Beverly bridge broke, making the firemen practically helpless. Meantime calls for assistance had been sent to near-by cities and an enormous quantity of apparatus ranging from the most antiquated tubs from towns and villages, to the new high-pressure automobile engine of the Manchester, N. H., fire department, responded. The Manchester engine undertook to pump water from the ocean. Boston, Lynn and other cities sent apparatus and details of police. But the combined efforts of the greatest aggregation of fire fighting machines ever seen here were futile and when darkness fell dynamite was used.

Railroad to Charge for Transporting Apparatus.

Dover, N. H.—The latest general order from the headquarters of the Boston & Maine officials states that hereafter on all occasions where it becomes necessary to transport fire apparatus and fire fighters from one town or city to another over the tracks of the railroad some reliable party must first guarantee the expense incurred before the apparatus will be conveyed and that in the future no fire apparatus will be conveyed without charge. This announcement appears to meet with general disapproval in all sections of this state and especially in this city as it has been necessary on numerous occasions to convey both apparatus and men to various of the surrounding towns and cities to assist in extinguishing fires, and for which work no charge has ever been made in the past either by the local fire company or by the railroad, and in a number of instances the department has been called to protect the property of the Boston & Maine railroad and have worked for several hours for practically nothing. In view of the fact that a number of the surrounding towns depend on Dover in emergency cases to assist them in times of fire, the new ruling of the railroad is being severely criticized, as in addition to endangering the property in the towns it may also result in the destruction of the railroad's property. In the opinion of the heads of the fire department the action to reduce the running expenses of the railroad is liable to result in losses which will greatly exceed the amount they may realize from the charging for transportation, and instead of maintaining the harmony between the road and the members of the fire department will be more liable to cause a breach which will not be soon remedied.

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Courtesy Lynn (Mass.) Item.

LYNN'S MOTORIZED HOSE WAGON.

The Cost of Fire Equipment.

South Bend, Ind.—The per capita cost of the fire extinguishing equipment in Indiana cities is \$1.13, according to the weekly bulletin issued by the state fire marshal. The per capita cost of South Bend, with a population of 53,684, and 64 firemen, is given as \$1.37. Mishawaka, with a population of 11,886 and 12 firemen, has a per capita cost of 99 cents. The cost for Elkhart is \$1.26, and Goshen \$1.78.

MOTOR VEHICLES

Another Lynn Hose Wagon Motorized.

Lynn, Mass.—This city believes ardently in motorization of its fire apparatus—and practices what it believes. Engine 4 hose wagon of the Broad street engine house has been motorized. It is equipped with a two and a half-ton Federal truck, and will make 28 miles an hour. All equipped this piece of kit weighs 6638 pounds. There are accommodations for the whole company and 1100 feet of hose is carried.

Test New Auto Truck.

El Paso, Tex.—In a very rigid test the new triple combination American-La France fire apparatus, recently purchased by the city of El Paso, was demonstrated on the highest office structure in the city. The truck proved equal to the test, throwing a single stream of water a height of 160 feet to the top of the building, and at one time even higher, the spray mounting half up the 30-foot flag pole which tops the skyscraper. The test, which was given for the benefit of State Fire Marshal S. W. Inglish, of Austin, who came here especially to see the apparatus in action, was under the direction of Fire Chief W. W. Armstrong and the central department company. At the time the

stream was pouring water on the roof, the engine was pumping 1034 gallons of water a minute. The contract with the American-La France company, when the truck was purchased, was that it should pump 700 gallons per minute. In the test the engine ran continuously for 30 minutes, without missing. State Fire Marshal English was highly pleased with the demonstration and a discussion of it will be contained in his annual report. It is possible that it may have the effect of further reducing El Paso's fire insurance rate, which now is 19 cents, the lowest in the state.

New Combination Ordered.

Superior, Wis.—The triple combination pumper, chemical and hose truck ordered for the Superior fire department will arrive about October 1, according to a communication received by Fire Chief Johnson from the American-La France company. With the arrival of the new piece of apparatus five horses used by the department can be dispensed with and two pieces of apparatus, a steam pumper and a hose truck, will be removed from active service.

GOVERNMENT AND FINANCE

Hagerstown Defeats Commission Government.

Hagerstown, Md.—By a majority of 172 votes, Hagerstown citizens at a special election decided to retain the present form of government in place of the commission form. A total of 2234 out of approximately 6000 voters participated in the election. The special election was held under an act of the late General Assembly of Maryland. This election was the first time that the citizens in the territory annexed under the city extension bill in the late Legislature had the right of municipal suffrage but few of them took advantage of the opportunity to vote. The campaign for and against commission form has been a lively one. Ever since the passage of the bill by the Legislature, providing for a special election to be held June 22 to vote on a change of government, those in favor of the charter have been putting up a stiff fight in behalf of the commission form. Much data showing the successful operation of the commission form in other places was secured and given wide circulation.

Abolish Dual Form of Government.

Torrington, Conn.—At one of the hottest town meetings held in years, the dual form of government that has existed in Torrington for over twenty years was changed to a single form by a vote of 179 to 59. For a long period the citizens have been discontented with the dual form of government, considering that Torrington, the largest town and boro in the country, would be better served by a consolidation of town and boro. It was decided therefore to call a special meeting. A committee was named to recommend a form of single government and will announce the new form at an adjourned special town meeting.

Charter Government Legal.

Columbus, O.—By sustaining a demurrer filed by the new board of civil service commissioners of Dayton to the petition of the old board of commissioners, the Supreme Court has upheld the new charter commission, which recently superseded the old form of government in Dayton. The members of the old civil service commission whose terms had not expired contended that they could not be replaced by the new board provided under the charter. The decision of the court practically means that in cities where a charter form of government is provided, this form supersedes that provided by the old law as a result of the recent constitutional amendment. This action of the highest tribunal in the state terminates a long-drawn-out conflict, instituted for the purpose of determining whether the newly constituted body had a legal existence or whether the old civil service commissions' tenure continues until the various terms naturally expire. The contention that the old civil service commission was legal and should be allowed to continue in existence until the terms of its various members naturally expire, was based upon the allegation that the state law contained such provision and that it could not be superseded by a municipal charter.

RAPID TRANSIT

No Seat, No Fare.

Trenton, N. J.—A passenger who refuses to pay a fare on a railroad train unless provided with a seat is not a disorderly person within the meaning of the act of 1911, according to an opinion filed in the Supreme Court by Justice Swayze, setting aside the conviction of Calvin Burns. Burns boarded a crowded car of the Atlantic City & Shore Railroad at Pleasantville. He refused to pay his fare on the ground that he had no seat, and remained on the car, although he might have alighted at two regular stops. There was no declaration that Burns entered the car with the intention of traveling without paying his fare, nor was there proof that he violated any rule of the company. Upon these two grounds primarily Justice Swayze held that the conviction should be set aside.

To Regulate Street Cars.

Richmond, Ind.—An ordinance has been introduced in council and advanced to second reading, which, if passed, will eliminate Richmond's several awkward street cars, which have the entrance in the front part, and compel the street car company to have conductors on all of its cars. It has been the custom to operate cars on some lines without conductors. The company has objected to placing conductors on these cars, saying the revenue from these lines did not justify such action, but expressed a willingness to place mirrors in the front of the cars so the motormen could see when passengers had safely boarded the cars or alighted from them. Council is of the opinion, however, that these mirrors would be impracticable. The second section of the ordinance provides that only cars where passengers can enter or depart at or near the rear end on the right-hand side can be operated. Violation of this ordinance provides fines for both the company and the motormen operating them.

MISCELLANEOUS

Bells to Guard Crossings.

Douglas, Ariz.—Railroad crossings at street levels will have automatic electric bells installed in the near future, according to a letter from the railroad. The signals will be automatic and will operate whenever a train approaches the crossings, giving due warning to pedestrians and vehicles of the danger of crossing. At night electric lights will be automatically lighted on the approach of a train.

City Responsible for Submerged Piling.

Salem, Ore.—The Supreme Court in an opinion written by Justice Eakin, reversed the Circuit Court for Multnomah County in the case of the Hosford Transportation Company vs. the City of Portland, respondent. During the construction of the Hawthorne bridge, plaintiff's tugboat struck some submerged piling, and a suit was instituted for damages. The lower court held that the city was not liable, but the Supreme Court held that it was, saying that it is the city's mandatory duty to keep the river free from obstructions occasioned by the removal of the old bridge or the construction of a new one.

Trouble with Plumbing Regulation.

McKeesport, Pa.—This town has a rather peculiar situation on its hands. Recently the town established a bureau of plumbing inspection and a board of examiners. Under the state law all plumbers operating in cities must pass examinations. More than half the plumbers in McKeesport failed at the examination. This is sufficient to disqualify them from engaging in business until next year at least, when another examination will be held. Rather than force all the plumbers to go out of business the law department of the town has decided to test the constitutionality of the law. A friendly suit will be started and will be carried up to the Supreme Court. The action will give the unsuccessful plumbers a period of temporary relief from the exactions of the bothersome law. But in the meantime the board of examiners will not give certificates to those plumbers who could not pass the examination.

LEGAL NEWS

A Summary and Notes of Recent Decisions— Rulings of Interest to Municipalities

Public Improvements—Necessity—Presumption.

Fisher et al. v. City of St. Albans.—Where a city charter authorized the construction of necessary sewers, and an ordinance provided that whenever the public health or convenience required the laying of sewers it should be done, a finding by the council that a sewer was necessary is essential to its jurisdiction to construct the sewer, and such finding must affirmatively appear in the proceeding. No presumption that the construction of the sewer was found to be necessary arises from the fact that the petition for it was acted upon favorably by the council.—Supreme Court of Vermont, 90 A. R. 582.

Eminent Domain—Property Subject to Appropriation.

St. Louis & S. F. R. Co. et al. v. City of Tulsa et al.—Under general statutes authorizing a city to condemn right of way over property or right of way previously acquired for a public use by any other corporation, where not inconsistent with the purposes for which the property was taken or acquired by the latter, the city has no power to condemn right of way for the extension of a street across the station yards of a railroad company, however the land was acquired, upon which it maintains numerous tracks and switches for the moving and storage of cars, where such extension would necessitate the moving of switches and switch stands and leading tracks and compel the shortening of the yard tracks to the inconvenience of the company and the detriment of its business.—District Court, E. D. Oklahoma, 213 F. R. 87.

Actions—Presenting Claims for Allowances—Statutory Provisions.

Carthew v. City of Platteville.—A statute, providing that no action shall be maintained against any city on any claim of any kind until claimant shall have first presented it to the counsel for allowance, and the same shall have been disallowed, does not apply to an action for equitable relief based on a city maintaining a nuisance, and the mere fact that the party complaining is also entitled to money damages does not bring the case within the statute.—Supreme Court of Wisconsin, 147 N. W. R. 375.

Action for Death—Liability.

Elliott et al. v. City of Brownwood.—Under the statute authorizing an action for death by negligent act, a municipal corporation is not liable for the death of a person caused by its negligence in maintaining its streets.—Court of Civil Appeals of Texas, 166 S. W. R. 932.

Street Improvements—Notice.

Phoenix Brick and Construction Co. v. Gentry County.—Under an ordinance, providing that, when the board of aldermen shall deem it necessary to improve any street for which a special tax must be levied, the board shall declare, by resolution published for two weeks, that such work or improvement is necessary, a resolution is insufficient which merely states that it is necessary to pave a street, and does not specify the kind of paving or refer to plans or specifications containing the required information, for, unless the resolution contains such information, property owners cannot know how to exercise their right of protest.—Supreme Court of Missouri, 166 S. W. R. 1034.

Defective Streets—Death of Animals—Evidence.

Russell v. City of Ashland et al.—Where, in an action against a city and its subcontractor for the death of a horse on a defective street, there was evidence of some negligence of the city and its subcontractor improving the street, but the driver might have known the condition of the street at the place of the accident, or the horse might have been driven to death, the court properly directed a verdict for the city and its subcontractor.—Court of Appeal of Kentucky, 166 S. W. R. 971.

Raising Grade Crossings—Damages.

Otis Elevator Co. v. City of Chicago.—Where a city, for the purpose of securing the elevation of railroad tracks, agreed with the railroad companies to pay such damages as they might become liable for by such elevation, the city would only be liable for resulting damage to private property in cases where the railroad companies would be liable to the owners: the purpose of the agreement being to determine, as between the city and the railroad companies, who should pay the damages legally recoverable, and not to protect the property owners.—Supreme Court of Illinois, 105 N. E. R. 338.

Municipalities—Powers—Ordinances.

City of Marengo v. Rowland.—Since municipalities exercise only delegated and limited powers, and have only such powers as are granted to them by the Legislature, the power of a city to pass an ordinance must be found in its charter in express terms, or it must be necessary to carry out the powers expressly granted, and not simply convenient to the declared objects and purposes of the Legislature.—Supreme Court of Illinois, 105 N. E. R. 285.

Deficits in Streets—Actions—Complaints.

City of Indianapolis (Ind.) v. Slider.—In an action against a city for injuries caused by a tree falling on plaintiff, a complaint, alleging in effect that the city had full knowledge of the dangerous condition of the tree and could have known of such condition by the exercise of reasonable care, that it negligently and carelessly allowed it to stand in the street for four weeks after obtaining such knowledge, and that, by the exercise of reasonable care, it could have been removed within that time sufficiently alleged both actual and constructive knowledge without alleging the exact nature of the actual notice or that the defective condition of the tree was open and obvious and had been so for such length of time that notice would be imputed to the city.—Appellate Court of Indiana, Division No. 2, 105 N. E. R. 56.

Public Improvement—Employment of Superintendent.

City of Colorado Springs v. Coray.—Where the superintendent for the construction of a city hall was not employed as provided for by statute and by the ordinances of the defendant municipality, his employment cannot be ratified except by the formalities prescribed by the statute, and a mere acceptance of his resignation, without any other action, does not constitute ratification.—Court of Appeals of Colorado, 139 P. R., 1031.

Ordinances—Requisites—Validity—Arbitrary Power.

Lynch et al. v. Town of Northview (W. Va.), et al.—Municipal ordinances placing restrictions upon lawful conduct or the lawful use of property must specify the rules and conditions to be observed in such conduct or business, and must admit of the exercise of the privilege by all citizens alike who comply with the rules and conditions. A municipal ordinance making it unlawful to dig in the streets for the purpose of laying gas pipes, "without the consent of the council of the town entered upon the record of said town," is void, for the reason that it vests the council with arbitrary power to discriminate between citizens who may wish to obtain the privilege.—Supreme Court of Appeals of W. Va., 81 N. E. R., 833.

Billboard Ordinances—Construction—Application.

Thomas Cusock Co. v. City of Milwaukee (Wis.) et al.—Under an ordinance providing that no billboard, board, fence, or other structure of any kind to be used for advertising purposes shall be maintained except as provided, a landowner may permit advertisements to be placed on a fence built around a lot; but, if the fence is built simply for advertising purposes, the ordinance must be complied with. Buildings may be used for billboards without complying with the ordinance if constructed for other purposes; but, if a mere shell of a building is erected merely to use its walls for advertising purposes, it must comply with the billboard ordinance.—Supreme Court of Wisconsin, 147 N. W. R. 30.

NEWS OF THE SOCIETIES

Calendar of Meetings.

July 3-4.

AMERICAN SOCIETY OF ENGINEERS, ARCHITECTS AND CONSTRUCTORS.—Midsummer Convention, Brighton Beach, N. Y. T. Hugh Boorman, Secretary, 35 W. 39th St., N. Y. City.

July 4.

SOCIETY OF ENGINEERING CONTRACTORS.—Annual Convention, Brighton Beach, J. Wemlinger, Secretary, 11 Broadway, N. Y. City.

July 8-9.

NORTH CAROLINA GOOD ROADS ASSOCIATION.—Annual Meeting, Durham, N. C.

July 16-19.

OHIO ELECTRIC LIGHT ASSOCIATION.—Annual Convention, Cedar Point Ohio. Secretary, D. L. Gaskill, Greenville, Ohio.

July 24-25.

TRI-STATE PACIFIC COAST GOOD ROADS ASSOCIATION.—Annual Convention, Medford, Ore. George E. Boos, Secretary, Medford.

Aug. 5-7.

COUNTY COMMISSIONERS OF PENNSYLVANIA.—Annual Convention, Erie, Pa. T. W. Waterhouse, Chairman Local Committee.

Aug. 10-12.

MONTANA GOOD ROADS CONGRESS.—5th Annual Convention, Great Falls, Mont. Secretary, Walter S. Clark, Great Falls.

Aug. 10-15.

MASSACHUSETTS STATE PERMANENT FIREMEN'S ASSOCIATION.—Annual Convention, Lynn, Mass.

Aug. 18, 19, 20.

FIREMEN'S ASSOCIATION OF THE STATE OF NEW YORK.—Geneva, N. Y.

Sept. 11-12.

STATE FIRE MARSHALLS' ASSOCIATION OF NORTH AMERICA.—Annual Convention, Asheville, N. C.

Oct. 28-31.

NORTHWESTERN ROADS CONGRESS.—Milwaukee, Wis. Secretary, J. P. Keenan, Milwaukee.

Nov. 9-13.

AMERICAN HIGHWAY ASSOCIATION.—Fourth American Road Congress, Atlanta, Ga. Secretary, J. S. Pennypacker, Colorado Building, Washington, D. C.

Nov. 18-20.

WASHINGTON STATE GOOD ROADS ASSOCIATION.—Spokane, Wash. Secretary, M. D. Lechey, Alaska Building, Seattle, Wash.

Dec. 14-17.

AMERICAN ROAD BUILDERS' ASSOCIATION.—11th Annual Convention; 5th Annual Good Roads Congress, and 6th Annual Exhibition of Machinery and Materials, International Amphitheatre, Chicago, Ill. Secretary, E. L. Powers, 150 Nassau st., New York, N. Y.

American Society of Engineers, Architects and Constructors.

At the annual convention of the Society to be held at Brighton Beach, N. Y., the following program will be followed, according to a communication from Secretary T. Hugh Boorman:

Friday, July 3d.

Opening Invocation by the Chaplain, Edmund Banks Smith, D. D., U. S. A., Governor's Island.

Address of Welcome by Mayor John Purroy Mitchell.

The following papers by: C. M. Ripley, E. E., on "The Policy of Electric Supply to City Buildings"; Carl M. Hansen, Secretary, Department of Accident Prevention, Workman's Compensation Service Bureau, on "Industrial Accidents, the Compensation and Prevention of it"; Gurdon S. Mumford, M. M., on "Some Problems in Concrete House Construction"; Manton E. Hibbs, C. E., on "The Philadelphia Smoke-proof Tower Fire-escape"; Reginald Pelham Bolton, C. E., on "The Increasing Necessity of En-

gineering Expert Advice in the Planning and Operation of Building"; William H. Tolman, Ph. D., Director, American Museum of Safety, on "Safety Pays."

Saturday, July 4th.

This day will be taken up entirely by the subject of "Good Roads" and there will be a paper by Hon. Logan W. Page, of Washington, D. C., on the subject, "Good Roads"; also by other prominent officials and authorities on Good Roads Construction.

North Carolina Good Roads Ass'n.

The Executive Committee of the North Carolina Good Roads Association have decided to hold the annual meeting in Durham, July 8th and 9th, and a most cordial invitation is extended to every one interested in the promotion of the good roads cause in North Carolina to attend and take part in this convention. An effort will be made to make this the most successful and interesting convention yet held by this association.

Southwestern Water Works Association.

The association held its third annual convention in Tulsa, Okla., June 15 to 17, with about 120 delegates attending. The by-laws of the American Water Works Association were adopted as the by-laws to be used by the Southwestern. A discussion on the policy of discontinuing the services of consumers who did not meet the payment of their bills brought forth several resolutions which were tabled because the laws prevailing in the seven states represented by the association differed on this matter.

That the general opinion of the delegates was against the supplying of free water was evidenced by a discussion following a paper by H. L. McDuffie on "Some Leaks."

These papers were read: Ralph Beaton, "Reciprocal Rights and Obligations of Water Companies and the Public They Serve"; H. L. McDuffie, "Some Leaks"; Mr. Haynes, "Collections"; H. A. Bittick, "The Practical Management of Water Works"; L. L. Ballard, "The History and Discussion of the Water Works of Tulsa"; O. H. Ade, of New York, "Economic Power Covering Natural Gas, Gasoline, and Crude Oil and Interior Combustion Motors"; Mr. Hughes, "Details and Practical Construction of Settling Basins and Reservoirs of Concrete." Galveston was voted as the city in which the 1915 convention will be held.

The following officers were elected: President, H. L. McDuffie, of Sherman, Tex.; first vice president, Luke L. Ballard, Tulsa, Okla.; second vice president, Jesse Shaw, Topeka, Kan.; third vice president, W. H. Bruce, Fort Smith, Ark.; fourth vice president, J. W. Lacy, Brookfield, Mo.; fifth vice president, L. H. Gray, Lifkin, Tex.;

American Society of Mechanical Engineers.

The Society held its spring convention in St. Paul, Minn., on June 16 to 18. Nearly 125 members and 200 guests attended.

The opening session was occupied by addresses of welcome delivered by Hon. A. O. Eberhardt, Governor of Minnesota, representatives of the Mayor of St. Paul, and of the Chamber of Commerce.

On Wednesday morning a business meeting was held, the important feature of which was the report of the committee on standard specifications for steam boilers and a standard code for the examination of firemen and boiler inspectors.

Following are some of the papers read at other sessions: "Adaptation of Powdered Coal to the Portland Cement Industry," by Prof. R. C. Carpenter, of Cornell; "Industrial Service Work in Engineering Schools," by Prof. J. W. Roe, of Yale; "Classification of and Heating Value of American Coals," by Wm. Kent; "New Apparatus for Measuring the Flow of Fluids in Closed Pipe," by A. M. Levin; "Method of Handling Coal at the Head of the Lakes," by C. H. Hutchinson.

After adjournment of the convention luncheon was served in the new mechanical engineering laboratory of the University of Minnesota.

State Firemen's Association of Michigan.

The fortieth annual convention of the State Firemen's Association of Michigan was held at Saginaw on June 23 to 25.

Discussions, sight-seeing tours, tournaments and exhibits all proved to be interesting to the delegates.

Petoskey was selected as the city for the 1915 convention and the following officers were elected: President, George W. Wallis, Saginaw; first vice president, William H. Reed, Petoskey; second vice president, George Langdon, Cheboygan; third vice president, John C. Hamilton, Reed City; statistician, Sam Robinson, Charlotte; secretary and treasurer, A. P. Lane, Ithaca.

New York State Fire Chiefs' Association.

On June 23 the New York State Fire Chiefs' Association opened its tenth annual convention with addresses of welcome by Mayor Schoolcraft and Mgr. Reilly. The program included the following topics:

Topic No. 1.—"Signor G. Marconi, Inventor of Wireless Telegraphy, use and possibilities of the wireless system with special reference to experimental wireless fire alarm," by David Sarnoff, contract manager of Marconi Wireless Telegraph Co.

Topic No. 2.—"The advantages of a Standard Test of Gas Fire Engines and some comment on the test at the 1913 convention at New York," by George

W. Booth, Chief Engineer, National Board of Underwriters. Discussions on this topic were led by Chiefs John Kenlon, of New York; B. J. McConnell, of Buffalo; Charles Little, of Rochester, and John Mulcahey, of Yonkers.

Topic No. 3.—"Pensions for Permanent Firemen," by Chief T. C. Collins, Cohoes. Discussions on this topic by Chief R. A. Maxon, Gloversville; Chief E. S. Shadwick, Saratoga; Chief E. J. Cooney, Little Falls; Chief John J. Crotty, Oneonta.

Topic No. 4.—"Fire Prevention in Factories and other Buildings," by Chief Thomas O'Connor, of the General Electric Fire Department, Schenectady. Discussions on this topic by J. M. Lynch, State Commissioner of Labor; ex-Chief John Quigley, Syracuse, of the State Department of Labor.

"Fire Prevention and Protection to other Buildings excepting Factories," by Thomas Ahearn, State Fire Marshal. Discussions on this topic by Chief C. N. Hogg, Binghamton; Chief John Espey, Elmira; Chief D. J. Sullivan, Utica.

The fire department of Schenectady was reviewed and fire equipment made by various manufacturers was exhibited.

An informal banquet was given on Tuesday night and a luncheon at the General Electric Works on Wednesday afternoon.

The following officers were chosen: President, Chief William Bridgeford, of Albany; vice president, Chief John Espey, of Elmira; secretary-treasurer, Chief H. R. Yates, of Schenectady (re-elected); directors, Chief T. C. Collins, of Cohoes, and Richard Purcel, of Richfield Springs.

Police Chiefs' Association of West Virginia.

The second annual convention of the Police Chiefs' Association of West Virginia was held in Wheeling on June 23 and 24.

The morning session of the first day was given up to routine business and the appointment of a civil service and uniform committees. An address of welcome was delivered in the afternoon by Mayor H. L. Kirk, and the evening was made enjoyable by a banquet.

On the second day were passed resolutions favoring a law whereby the police are placed on civil service basis, and that the Johnson pistol law be so amended as to allow officers from other states coming to West Virginia for prisoners to wear their guns without liability to be fined or prosecuted.

Charleston was chosen as the convention city for 1915, and the following officers were elected: President, Thomas Leyland, of Wheeling; vice president, H. L. Brooks, of Clarksburg; secretary-treasurer, A. R. Hunt, of Huntington; assistant secretary, Walter Worls, of Wheeling; executive committee, Sam Davis, of Huntington; P. M. Hollis, of Martinsburg; C. C.

Clingenpeel, of Huntington; D. B. Crockett, of Charleston; W. E. Games, of Moundsville, and Thomas Feltz, of Bluefield.

United States Good Roads Association.

The United States Good Roads Association, of which organization Senator John H. Bankhead is president, is making an active effort to induce the people of the United States to observe August 14th-15th as Good Roads Days. In 1911, Mr. J. A. Rountree, secretary of the United States Good Roads Association, as well as the Alabama Good Roads Association, inaugurated a movement to observe Good Roads Days, August 14th-15th. The movement was launched and Alabama was the first State to observe these days. Since that time over fifteen States in the Union have commenced to observe Good Roads Days, selecting various days of the months for the same.

At the last meeting of the United States Good Roads Association, a resolution was introduced by Governor E. W. Major, of Missouri, calling upon the Governors of the various States to issue proclamations for Good Roads Days, also calling upon the county and road officials and mayors to do likewise.

Since that meeting President Bankhead and Secretary Rountree, of the Association, have conducted an active campaign in accordance with this resolution. Information has been received at headquarters showing that over a dozen Governors endorsed the movement and will issue proclamations. Gov. Emmet O'Neal, of Alabama, has issued a proclamation calling upon the people to observe Good Roads Days. The prospects are quite bright that Good Roads Days will be observed all over the United States. If the active work and persistent efforts of the United States Good Roads Association counts anything, it will not be long before the whole nation will be observing these days.

PERSONALS

The following mayors were recently elected:

Jackson, Tenn.—C. E. Griffin.
Pamplin, Va.—O. E. Peterson.
Saltville, Va.—J. S. Goethius.
Charleston, S. C.—Dr. Thomas B. Smith.
Blacksburg, Va.—Dr. F. W. Eheart.
Abingdon, Va.—Thomas H. Crabtree.
Holland, Va.—J. P. Dalton.
Amherst, Va.—Edward Meeks.
Whyteville, Va.—W. C. Thomas.
Decatur, Ala.—Capt. P. J. Edwards.
Tiptonville, Tenn.—B. F. Le Duke.
Stuart, Va.—M. D. Bailey, Jr.
Bay Springs, Miss.—R. L. Abney.
Crisfield, Md.—Elmer R. Gandy.
Marion, Va.—G. H. Fudge.
Springfield, Tenn.—Chas. E. Bell.
Westville, N. J.—William A. Watson.
Knoxville, Tenn.—Charles Hollingsworth.

Yorkville, S. C.—J. C. Wilburn.
Douglas, Ariz.—Hugh Ellis.
Glendale, Ariz.—Dr. J. T. Pearson.
Tempe, Ariz.—J. T. Birchett.
Nashville, Tenn.—B. C. McGill.
Yorkville, Pa.—J. C. Wilborn.

Petersburg, Va.—At the annual caucus of the city council, the following officials were chosen: G. B. Gill, city auditor; George Mason, city attorney; Dr. R. A. Martin, health officer; W. T. Mulcaha, register of the water works.

Miami, Ariz.—These officers were elected: George Cook, superintendent of water department; Neil M. Allred, city attorney, and T. Shea, sanitary officer.

Columbus, Ohio.—Harry Smith has been appointed assistant city engineer.

New York, N. Y.—The Public Service Commission for the First District has appointed Joseph Johnson, chief of the transit bureau of the commission at a salary of \$7,500 a year. Mr. Johnson was fire commissioner under the late Mayor Gaynor's administration.

Temple, Tex.—D. M. Seybold has been elected by the water commission as superintendent of the water department.

North Adams, Mass.—Mayor Brown has announced the appointment of John Martin as commissioner of public works.

Johnson, A. N., for the past eight and one-half years chief engineer of the Illinois Highway Commission, has tendered his resignation to take effect July 1. Mr. Johnson resigns his position as State highway engineer to accept a position on the staff of the Bureau of Municipal Research with headquarters at 261 Broadway, New York.

Scofield, E. M., president of the Scofield Engineering Company, Philadelphia, has been appointed vice president of the Texas Southern Electric Company, financed by Warner, Tucker & Co., of Boston, and owning and operating public utilities in southern Texas.

Graham, J. R., has resigned as assistant city engineer of Minot, N. D., to accept the position of engineer with James Kennedy, contractor, of Los Angeles, Cal.

Craven, Jay A., sanitary engineer and water chemist, Indiana State Board of Health, has joined the staff of Morris Knowles, consulting engineer, Pittsburgh.

Baker, George W., has been appointed assistant city engineer of Dayton, Ohio.

Greiner, John E., consulting engineer, of Baltimore, has been retained by the Maryland State Roads Commission as consulting engineer in the construction of the proposed new bridge over the Patapsco River.

Morse, William F., consulting sanitary engineer, of New York City, has taken up his patents formerly in other hands and in addition to his consulting practice is now engaged in the installation of refuse disposal plants.

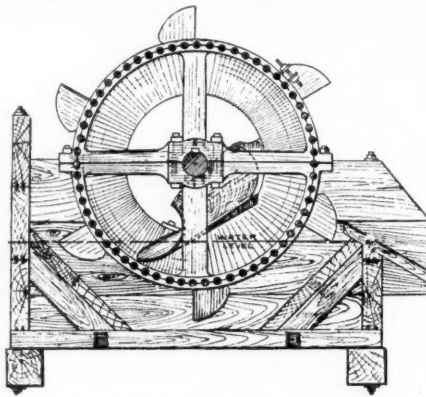
NEW APPLIANCES

A POWER TRACTION TAMPER.

A Self-Propelled Tamping Machine with a 750-Pound Ramming Power and a 32-Inch Transverse Range.

The Pawling & Harnischfeger Company of Milwaukee, Wis., is now placing on the market a tamping machine for trench and sidewalk tamping which is self-propelled. The machine is equipped with a tamping ram weighing 150 lbs. and striking 50 blows per minute of approximately 22-inch stroke. The frame in which the tamping ram is mounted has a transverse movement of 20 inches across the machine. The tamping head is 12 inches wide. The total distance covered transversely is therefore 32 inches, which is sufficient for efficiently tamping a 40-inch trench or sidewalk. The power traction gives the machine a road speed of about 1½ miles per hour and working speeds when tamping of from 10 feet to 25 feet per minute, depending upon the width of area being tamped. Gearing is provided for reversing both the road and working speeds. The machinery is mounted upon a four-wheel truck with adjustable wheels so that the tread can be varied from 4 feet to 8 inches to 6 feet 8 inches. In addition the rear wheels are mounted so that they can be in-

dependently adjusted 10 inches vertically to compensate for the crown of the road and enable the machine to work with the wheels on one side on the pavement and those on the opposite side in the street. The forward or steering axle is swiveled in a ver-



THE "NEW CENTURY" SCREEN.

tical plane to permit of the same adjustment at this end.

The machine is operated by a 4-horsepower vertical water-cooled gasoline engine mounted over the forward axle. This engine is equipped with a friction clutch and drives the main counter shaft of the machine by means of a high speed roller chain. A second chain driven from counter shaft operates the splined lifting shaft.

The tamping ram, consisting of a hard wood board reinforced on its edges by steel straps and the metal tamping head, is intermittently clamped between a segmental wheel and a pulley and is lifted by friction. The segmental wheel is made mounted upon the splined shaft. Pressure between the two wheels is obtained by means of a spring. When desired the ram can be thrown out of action by means of a lever which operates a set of holding dogs, which clamp the board, and also toggle links, which work against the spring and throw one of the wheels out of contact with the board. The tamping ram and lifting mechanism are mounted in a frame supported at one end by the splined shaft and at the other by a

roller, which runs on a supporting track riveted to the frame work of the car. Transverse motion of the tamping frame is obtained by a wheel, and an arrangement of drums and wire ropes. Worm and worm wheel steering mechanism is provided, operated by the hand wheel, while all operating wheels and levers are arranged within convenient reach of the operator's seat.

In the illustration the tamper is shown at work tamping preparatory to the laying of a sidewalk.

DISINTEGRATING AND WASHING SCREEN.

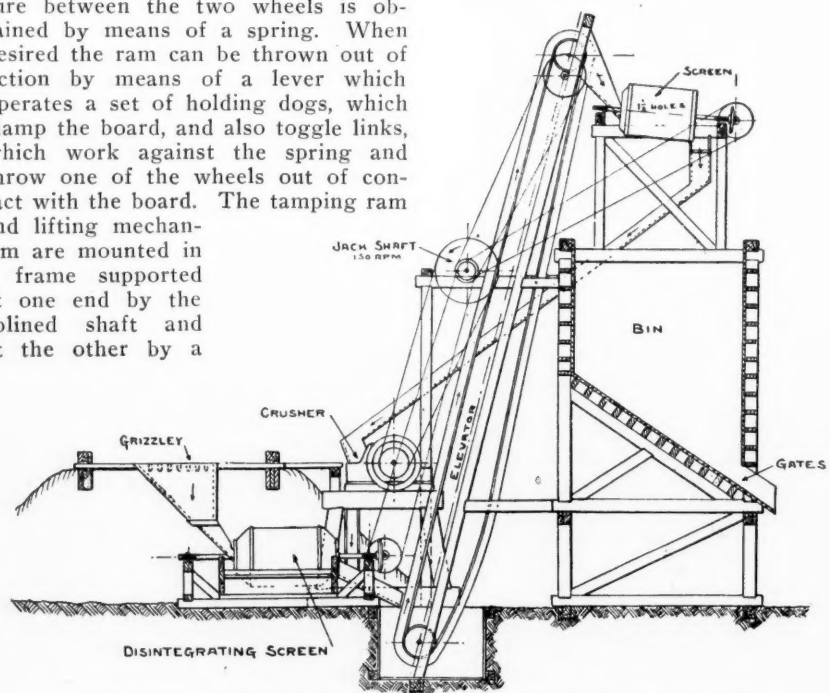
"New Century" Machine Breaks, Screens and Washes in One Combined Operation.

The contractor who is working on a concrete road job does not have to buy his gravel. If he has a gravel bank and a fair supply of water near the job he can prepare his own stone or gravel. The American Concentrator Co., Springfield, O., provides the contractor who needs clean sand and rock with a simple portable outfit for this work. It should certainly reduce the costs of concrete. The "New Century" disintegrating and washing screen is claimed to handle ten to twenty tons of material per hour as it comes from the bank—and to take boulders up to ten inches in diameter without damage. Every piece of rock or gravel is discharged practically dewatered and clean from clay or dirt. The fine material can be run to waste or else sized and washed free of loam if it holds good sand.

The machine consists of a screen



POWER TRACTION TAMPING-MACHINE TAMING SIDEWALK.



SEMI-PORTABLE GRAVEL WASHING AND CRUSHING PLANT.

revolving in a tank in which water is kept to the level of an apron in front. The water—averaging usually about thirty-five gallons per minute—is piped under a moderate head into the discharge end of the tank. The material falls into the water and is disintegrated by one-inch bars extending between and into the opposing faces of the heavy cast hoods. These bars are one inch apart and are sup-

at 300 to 400 revolutions per minute. A full line of trommels and elevators are also offered.

The illustrations show the disintegrating and washing screen and semi-portable outfit.

CONCRETE JOINT PROTECTION PLATE.

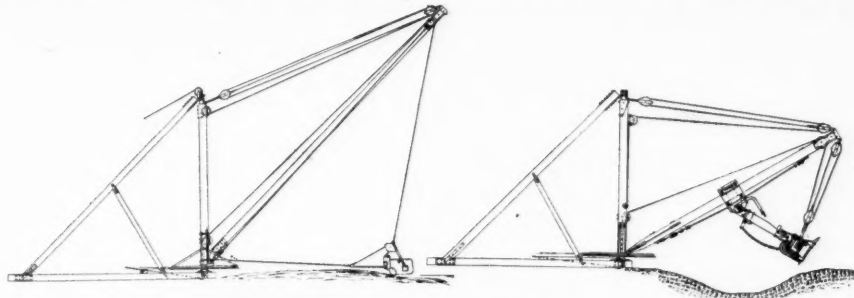
Albert Moyer, 200 Fifth Avenue, New York City, is making a new type

by bending the legs out so that a chair is formed.

"IMPROVED" DERRICKS WITH CONVERTIBLE FITTINGS.

Portable Derricks of All Types—Frame, Revolving, Drag Scraper and Excavator Derricks.

The National Equipment Co., Chicago, is making a full line of derricks and excavators with improved and convertible parts. The various weight-carrying parts are strengthened both in material and design, and the fittings are interchangeable, making the derricks very useful on miscellaneous jobs and economical in maintenance. The portable frame derrick and the revolving derrick may be put on rollers or wheels. The drag scraper derrick is especially adapted for the conditions under which it is designed to work, but the convertible fittings makes it useful for grab bucket work. The "Neco" excavator derrick is designed to do steam shovel work like trench excavating or road work at a first cost less than that of a steam shovel and a wider range. The dipper is arranged to dump by hand line or automatically and only one man is required to operate the excavator derrick with a double drum hoisting engine and derrick swinger. This derrick may be used for any other derrick purpose by disconnecting the dipper.



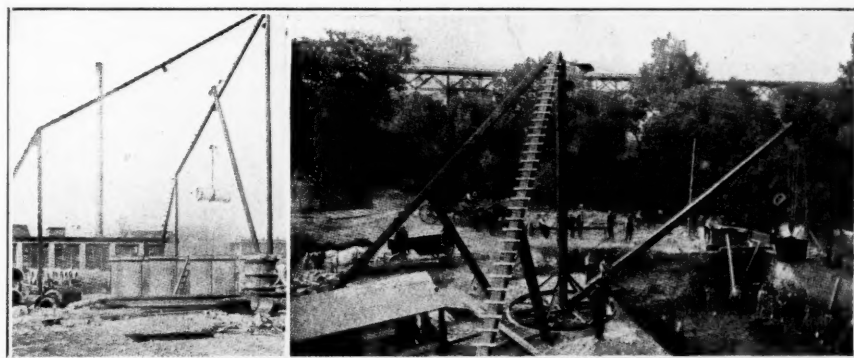
"IMPROVED" SCRAPER AND EXCAVATOR DERRICKS.

ported by heavy cast spiders which carry the weight of the screen. Outside this revolving grizzly is a perforated metal jacket, with holes of any size desired, held in place by draw bands. On the outside of this jacket are the elevator cups. The finer material passes through the perforations into the tank, is carried away by the elevator cups and discharged on an apron from where it may be conducted to any point. The coarse material and all boulders are picked up by a plow-shaped casting fastened to the inside of the cast hood at the discharge end and are elevated out of the water and slid down the discharge into a hopper, the jaws of a crusher or a picking table as the case may be.

The machine is built in three sizes, varying in the length of the perforated jacket. It may be driven from a gasoline engine, small steam engine or electric motor. A whole portable gravel washing plant consists of a disintegrating screen complete with tank, bucket, elevator and hopper bin. A semi-portable outfit consists of a disintegrating screen, a continuous bucket elevator, a sizing trommel and a Blake crusher.

The Blake crusher uses the patent Arctic Bumper. This eccentric bumper is cored out above the eccentric shaft bearing and a current of cold water permitted to flow through it, entering through the hose. This allows the crusher to run continuously

of concrete joint protection plate. This is made of open hearth soft steel calculated to wear down at the same ratio as the concrete—in this way protecting the concrete edges from spalling. No installation device is required except a piece of short pipe for bending down the legs and bending out the side tongues. Two plates are wired together and clamped with a piece of tar paper between. The legs are driven into the sub-base of the road so

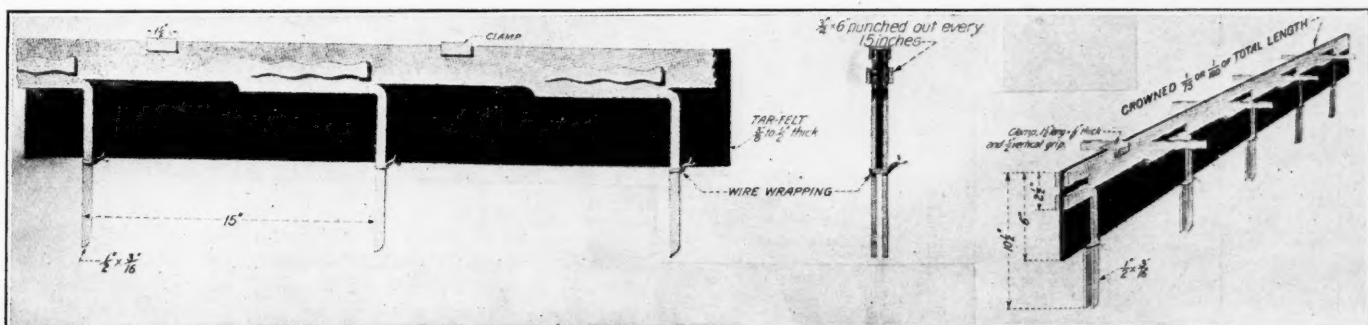


DERRICKS HANDLING PIPE AND EXCAVATING.

that the top of the plate is exactly at the level of the finished concrete—a duplicate of the template to be used in crowning being used. The joint work can thus be kept as far ahead of the concrete gang as the sub-base. If the concrete is laid over an old macadam road the Moyer joint may be used

The capacities of this dipper are $\frac{1}{2}$, $\frac{5}{8}$, $\frac{7}{8}$ and 1 cubic yard.

As examples of the improvements may be mentioned that in these derricks the mast bottom (which is patented) runs in oil in a covered cavity, thus reducing frictional wear. The connection of the boom line is made



THE MOYER CONCRETE JOINT PROTECTION PLATE—METHOD OF INSTALLING.

safe by the mast top having a wrought steel clevis forged around the gudgeon to which is attached the boom line.

The derricks are made with any combination of boom and load operation. The illustrations show the derricks at work and the diagrams illustrate the construction of the scraper and excavator types.

THE MILWAUKEE MAID

A Portable, Medium Sized Concrete Mixer.

The "Milwaukee Maid" is the attractive name of a $5\frac{1}{2}$ cubic foot mixer made by the Cream City Boiler Co., Milwaukee, Wis. The drum is large, holding $5\frac{1}{2}$ cubic feet dry and $3\frac{1}{2}$ cubic feet wet and its interior design has no sharp corners where concrete may stick. The central shell is of extra heavy boiler plate steel and fits the drum head tightly. The height of the hopper is only 43 inches—which should effect quite a saving in charging. The discharge is $25\frac{1}{2}$ inches from the ground. The steel discharge chute is designed for easy operation so that the operator may take out the exact quantity desired. It is built for barrow clearance and special splash plates in the drum head openings prevent spilling. The engine is smooth and is claimed to give liberal power with economy of gasoline and without unnecessary rattling. The general dimensions of the truck are: length 7 feet, height 2 feet and width 3 feet. The housing is 3 feet $8\frac{1}{2}$ inches long, 2 feet 9 inches high and 3 feet 1-2 inch wide. The mixer may be hauled by man-power.

The Chicago Sales Agent for the "Milwaukee Maid" is Thos. M. Roche, Monadnock Building.

A TUBULAR SAND AND GRAVEL WASHER.

Dull Washer May Also Be Used for Filter Sand.

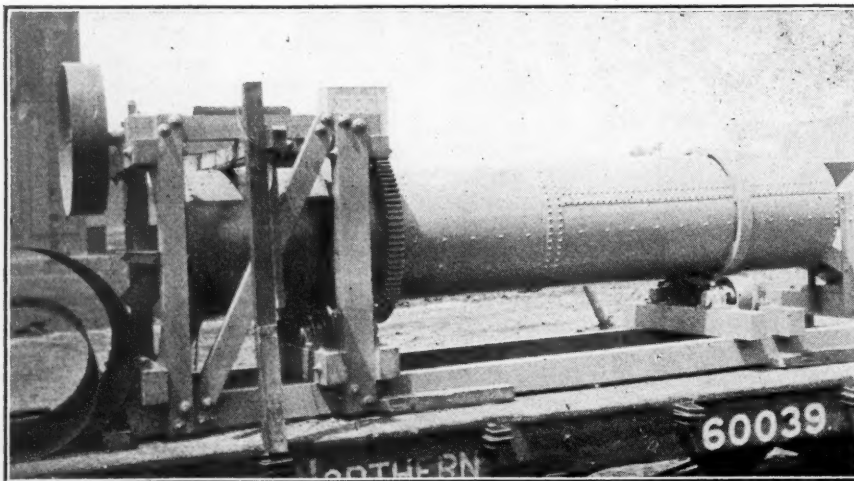
The Dull Tubular Washer, which was placed on the market last year by the Raymond W. Dull Company, 1910 Conway Building, Chicago, was designed

primarily to wash sand and gravel for concrete purposes but its success warranted its use for more difficult materials such as filter sands, foundry sands and materials containing coal dust. The machine consists of a cylinder which revolves on chilled trunnion wheels. The inside of the cylinder has several lifting angles running the total length of the shell. The rotation of the cylinder causes the lifting angles to pick up the material and carry it up to the top and then discharge over a series of fixed shelves. The fall of the material over the shelves scours it and as the shelves are arranged so that the lower series is set ahead of the upper series of shelves the material progresses forward as it falls. The washing water flows in the opposite direction from the travel of the material, thus



THE "MILWAUKEE MAID" MIXER.

insuring that the material will be discharged where the water is cleanest. The cylinder retains considerable water in the machine to do the washing. The progress of the material through the machine is governed by moving the lower series of steps. By increasing the number of falls of the material the most difficult materials can be washed. The machines are made in four different sizes, ranging from thirty inches in diameter and eight feet long, to sixty inches in diameter and twenty feet long. They are constructed of heavy boiler plate and have steel tires and trunnion wheels with chilled tread. The illustration shows one of the washers in operation.



THE DULL TUBULAR SAND AND GRAVEL WASHER.

INDUSTRIAL NEWS

Cast Iron Pipe.—Chicago.—Quotations: 4-inch, \$26; 6 to 12-inch, \$24; 16-inch and upward, \$23.50. Birmingham.—Increase in inquiry reported and transactions were of volume to create good outlook. Quotations: 4-inch, \$20.50; 6-inch and upward, \$18.50; New York.—Prices said to be as low as pipe manufacturers are prepared to name. Quotations: Carload lots of 6-inch, \$20.50 to \$21 per ton.

Lead.—St Louis, \$3.80; New York, \$3.90.

Good Roads Down South.—That the South has not been getting due credit for its work in road improvement is indicated by a booklet just issued by the Barber Asphalt Paving Company, of Philadelphia. The first three or four pages contain 1914 photographs of Trinidad sheet asphalt pavements in Washington, D. C., Charleston, Louisville and New Orleans that are from 20 to 30 years of age. These views are followed by a score of pictures of the types of roadway now being built in Southern states. Virginia, Maryland, North and South Carolina, Georgia, Tennessee, Alabama, and Florida among the states represented. Bermudez asphaltic concrete is used quite often, but there are many good examples of asphaltic macadam or "penetration" roads and of highways resurfaced with liquid asphalt carpet coats. Instead of this advanced road construction being confined to big cities and their vicinity it is more or less of a surprise to find that small towns are laying asphaltic concrete roadways and not infrequently on a cement concrete base.

The Peebles Paving Brick Company, which has two plants at Portsmouth, O., has purchased a plant at Firebrick, Ky., and will manufacture the Dunn brand of Wire-Cut-Lug Brick.

The Electro-Bleaching Gas Co., New York City, has completed the installation of their new automatic chlorine plant at Dunkirk, N. Y. The water commissioners ordered the plant at a cost of \$700 during the recent typhoid epidemic.

The Mack Manufacturing Co., of New Cumberland, W. Va., has removed its Philadelphia offices from Fidelity Building to 1008 and 1009-a Lincoln Building at South Broad Street and Penn Square. Mr. R. T. Hutchins, with a corps of assistants, will be in charge of the offices.

The Economy Steel Flushing Machine Co., Council Bluffs, Iowa, has delivered a new "Economy" flusher and sprinkler to the City of Coffeyville, Kans. Three of the machines are at work in Kansas City, Kans.

ADVANCE CONTRACT NEWS

ADVANCED INFORMATION BIDS ASKED FOR

CONTRACTS AWARDED ITEMIZED PRICES

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS				
O.	Danville.....	July	5..10,000 sq. yds. of brick paving on concrete base.....	H. L. Maddock, Engr. Newark
O.	Estherville.....	Noon, July	6..Cement walks on various streets.....	N. B. Egbert, City Clerk
la.	Mason City.....	10 a.m., July	6..26,700 sq. yds. paving and 14,300 feet curbing.....	J. H. McEwen, City Clk.
la.	Marion.....	7.30 p.m., July	6..Cement sidewalks, 4 feet wide.....	P. O. Clark, City Clk.
la.	Fort Dodge.....	9 a.m., July	6..Constructing Portland cement combined curb and gutter.....	W. L. Tang, City Clk.
Pa.	Vandersgrift.....	July	6..Tarvia construction on brick pavements.....	Town Council.
Wash.	Connell.....	July	6..Constructing two miles permanent highway.....	J. W. Hamilton, Engr.
Ind.	Gary.....	July	6..Street improvements requiring 1,840 sq. yds. concrete, 9,225 sq. yds. sheet asphalt; 6,950 sq. yds. sidewalk; 9,250 sq. yds. surface dressing, estimated cost \$30,163....	W. J. Fulton, City Engr.
Cal.	Sacramento.....	July	6..Constructing several roads of Portland cement concrete; also grading, etc., in several counties.....	State Highway Comm.
Ill.	Pekin.....	8 p.m., July	6..Grading, repaving and paving and other street railway work.....	S. R. Derrick, City Clk.
S. C.	Mt. Pleasant.....	July	6..Laying 900 yds. cement pavements.....	E. Tincken, Chr. St. Com.
Cal.	Sacramento.....	2 p.m., July	6..Constructing about 60 miles of concrete road in various counties.....	State Highway Commissioner.
Wash.	Olympia.....	2 p.m., July	6..Surfacing with gravel or crushed stone, about 13.5 miles.....	State Highway Commissioner.
la.	Oskaloosa.....	8 p.m., July	6..Grading, paving with vit. brick and extending concrete curb.....	T. H. Carlin, City Clk.
N. J.	Metuchen.....	8 p.m., July	6..15,000 ft. more or less of bluestone flagging.....	Borough Council.
Wash.	Seattle.....	July	6..Constructing 27½ miles of highway, estimated cost \$160,000.....	Co. Comrs.
Quebec	Richmond.....	8 p.m., July	6..Bituminous macadam pavement, concrete sidewalks and gutter, etc.....	E. F. Cleveland, Sec.-Treas.
O.	Mineral City.....	July	6..Grading, curbing and paving.....	C. E. Kugler, Vil. Clk.
Ky.	Louisville.....	2 p.m., July	6..Constructing several vitrified block pavements.....	Board Pub. Works
Ind.	Tipton.....	July	6..Three gravel roads.....	G. H. Transberger, Co. Aud.
Ind.	Newport.....	10 a.m., July	6..Gravel.....	Roy Slater, Co. Aud.
Cal.	East San Diego.....	July	6..Improving portions of street by curbing, sidewalk and paving.....	City Clerk
Miss.	Forest.....	11 a.m., July	6..Six miles.....	W. A. Turner, Sec. Hwy. Comm.
N. J.	New Brunswick.....	July	6..Paving one street.....	City Clerk.
N. Y.	Albany.....	1 p.m., July	6..Improving highways in a number of counties. (See proposal ad.).....	J. N. Carlisle, Comr.
N. D.	Mohall.....	2 p.m., July	6..Three grading jobs.....	J. Carlson, Auditor.
Mont.	Roundup.....	July	6..Constructing cement crosswalks.....	City Clerk.
Md.	Easton.....	July	6..Paving about 20,000 sq. yds.....	F. C. Costenbarger, Jr., Ch. Eng.
Ind.	Greencastle.....	2 p.m., July	6..Constructing 7,235.15 ft. of gravel road.....	C. L. Airhardt, Co. Aud.
la.	Manning.....	July	6..Paving 24,000 sq. yds. and 6,600 ft. artificial stone curbing.....	City Council.
N. J.	Elizabeth.....	July	6..Paving several streets with brick and flagging.....	W. P. Neafsey, St. Comr.
Ind.	Rensselaer.....	2 p.m., July	6..Constructing one township road.....	J. P. Hammond, Co. Aud.
Ind.	Hartford City.....	2 p.m., July	6..One macadam road.....	County Auditor
Ind.	Salem.....	1.30 p.m., July	6..One township road.....	F. S. Numbkeldt, Auditor.
Miss.	Tupelo.....	Noon, July	6..Grading and surfacing with gravel, ½ mile.....	E. W. Robins, Hwy. Comr.
Ind.	Kentland.....	1 p.m., July	6..Grading and paving, three jobs.....	County Comrs.
O.	Cleveland.....	Noon, July	6..Grading, etc.....	Clerk Bd. Education.
Mo.	Jefferson.....	8 p.m., July	6..Constructing sidewalk.....	P. C. Harding, City Engr.
Pa.	Johnstown.....	5 p.m., July	6..Paving and curbing in several streets.....	H. H. Grazier, Supt. Highways
N. J.	South Orange.....	8 p.m., July	6..Constructing cement sidewalks on two streets.....	C. A. Cross, Chr. Twp. Com., Maplewood
Ind.	Monticello.....	10 a.m., July	7..Grading and paving, four jobs.....	County Comrs.
Kan.	Manhattan.....	July	7..2½ miles of cement sidewalks, 4-in. base and ½-in. top.....	City Clerk
Ind.	Logansport.....	10 a.m., July	7..One township road.....	C. E. Medland, Auditor
Ind.	Crawfordsville.....	10 a.m., July	7..One township road.....	B. B. Engel, Auditor
Ind.	Vincennes.....	11 a.m., July	7..Constructing one road.....	J. T. Scott, Auditor
Ind.	Lawrenceburg.....	Noon, July	7..One township concrete road.....	W. S. Fagaly, Auditor
Ind.	Kokomo.....	10 a.m., July	7..Three roads in one township.....	E. B. Swift, Auditor
Ind.	Lebanon.....	1 p.m., July	7..One gravel road.....	D. M. Clark, Auditor
Ind.	Madison.....	1.30 p.m., July	7..Gravel road in two townships.....	A. M. Taff, Auditor
Ind.	Rockville.....	11 a.m., July	7..Constructing several gravel roads in county.....	J. E. Elder, Co. Aud.
Wash.	Pullman.....	July	7..Paving streets.....	L. V. Edwards, City Eng.
Ky.	Burlington.....	July	7..20 miles of macadam road with bridges.....	City Clerk
Minn.	New Ulm.....	5 p.m., July	7..15,000 sq. yds. of paving, and about 4,000 ft. curbing, catch basins, etc.....	W. Backer, C. C.
Pa.	Lansdowne.....	July	7..Repairing cement sidewalks for the year.....	A. J. McCrudden, Boro. Engr.
Minn.	Sleepy Eye.....	8 p.m., July	7..Concrete streets and alley crossings.....	H. C. Peterson, City Rec.
O.	Columbus.....	2 p.m., July	7..Grading and paving roads with various materials in several counties.....	J. R. Marker, State Hwy. Com.
N. Y.	Niagara Falls.....	7.30 p.m., July	7..Seven paving contracts.....	F. S. Parkhurst, Jr., C. E.
N. Y.	Richmond Boro.....	Noon, July	7..Delivering 55,000 gals. of bituminous road surfacing material and several hundred tons of broken stone.....	C. J. McCormick, Boro Pres.
Ind.	Huntington.....	July	8..Grading, draining and paving several streets.....	H. Guthrie, Co. Aud.
Ill.	Springfield.....	July	8..Brick and concrete construction in several counties.....	State Hwy. Comm.
Ind.	Niles.....	10 a.m., July	8..Grading, gravelling and macadamizing.....	Board Co. Comrs.
S. D.	Wheeler.....	2 p.m., July	8..Grading number of highways.....	F. J. Kaberna, Co. Auditor
Tex.	Corpus Christi.....	4 p.m., July	8..Constructing concrete retaining walls, ballast stairways, sidewalks, curbs and gutters, etc.....	F. J. Mulligan, City Sec'y
Fla.	Fernandina.....	10 a.m., July	8..One five-ton road roller, one light road grader, one 30 H. P. traction engine, eight wagons and galvanized culvert pipe.....	Board County Comrs.
N. Y.	Binghamton.....	July	8..Constructing brick pavement on four streets.....	City Clerk
N. D.	Williston.....	July	9..About 60,000 cu. yds. of earthwork in road improvements.....	C. Field, Co. Surv.
O.	Dayton.....	10 a.m., July	9..Paving floors of several bridges with creosoted Hex blocks.....	County Comrs.
Ind.	Crown Point.....	July	9..Gravelling several roads.....	County Board Comrs.
Ill.	Rockford.....	11 a.m., July	9..14,277 sq. yds. of brick pavement and 7,300 ft. cement curb and gutter.....	W. W. Bennett, Pres. B. L. I.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Cal.	Oakland.....	11 a.m., July	9..Grading, curbing with redwood, paving with oil macadam and guttering with concrete, etc.....	F. M. Smith, City Clerk
N. Y.	N. Y., Bronx.....	10.30 a.m., July	10..Furnishing 125,000 gals. of asphalt road oil.....	E. Mathewson, Pres.
Fla.	Tampa.....	10 a.m., July	10..Improving one city road.....	W. P. Culbreath, Clerk.
O.	Cincinnati.....	Noon, July	10..Repairing pike 5,000 ft. and improving one road.....	County Comrs.
O.	Columbus.....	Noon, July	10..Constructing roadway on bridge.....	Franklin Co. Comrs.
O.	Akron.....	11 a.m., July	10..Grading, draining, curbing and paving.....	Co. Comrs.
Ind.	Brownstown.....	10 a.m., July	11..Gravel road.....	E. W. Edwards, Co. Aud.
Wis.	Marinette.....	2 p.m., July	11..Constructing macadam pavement.....	A. H. Holquist, Chr. B. P. W.
Minn.	Ivanhoe.....	1 p.m., July	11..Grading culverts, bridges, surfacing, cost about \$35,000..	K. A. Hansen, Co. Aud.
Minn.	Rochester.....	July	11..One portable gyratory stone crusher.....	L. J. Fiegel, Auditor
Minn.	Anoka.....	2 p.m., July	13..860 cu. yds. of surfacing, 954 cu. yds. macadamizing and 954 cu. yds. graveling.....	A. A. Caswell, Co. Aud.
Minn.	Grand Rapids.....	10 a.m., July	13..Constructing state road.....	M. A. Spang, Co. Aud.
Minn.	St. James.....	1 p.m., July	13..Bridge work, grading and turnpiking.....	J. C. Jensen, Co. Aud.
Minn.	Buffalo.....	2 p.m., July	13..Grading and graveling several roads.....	J. A. Berg, Co. Aud.
Minn.	Red Lake Falls.....	2 p.m., July	13..Constructing 10 miles of road.....	G. Du Pont, Auditor.
Minn.	Worthington.....	2 p.m., July	13..Grading, graveling and turnpiking nine concrete culverts, cost \$3,686.....	G. Swanberg, Co. Aud.
N. J.	Perth Amboy.....	2.30 p.m., July	13..Concrete pavement, distance, 3,260 ft.....	Bd. Chosen Freeholders
Minn.	Shakopee.....	10 a.m., July	13..Road culverts.....	A. J. Meyer, Co. Auditor
Ia.	Waterloo.....	7.30 p.m., July	13..Constructing pavement with vit. block or asphalt on concrete base.....	R. L. Degon, City Clerk
N. J.	East Orange.....	8 p.m., July	13..Laying about 2,550 sq. ft. of 4-ft. artificial stone walk.....	A. I. Webster, City Clerk
N. J.	Wellington.....	8 p.m., July	13..Re-macadamizing and repairing one street and furnishing 40 cubic yds. of inch stone.....	N. C. Berry, Boro. Clerk
Md.	Baltimore.....	Noon, July	14..Building 7 sects. of state hwy., aggregating 26.62 miles..	O. E. Weller, State Rds. Comr.
O.	Shaker Heights.....	Noon, July	14..Grading, draining, curbing and paving with brick, concrete, asphalt or bituminous macadam.....	C. A. Palmer, Village Clk.
O.	Wauseon.....	1 p.m., July	14..Road improvements.....	Comms. Henry & Fulton Cos.
O.	Bowling Green.....	1 p.m., July	14..Grading, draining and macadamizing, also applying tar and bituminous binder.....	C. E. Stinebaugh, Co. Aud.
O.	Springfield.....	10 a.m., July	14..Installing new creosoted wood block on several bridges..	County Commissioners
La.	New Orleans.....	Noon, July	14..Gravelling 13 miles of public highway.....	W. Atkinson, State Hwy. Eng.
Minn.	St. Paul.....	2 p.m., July	14..Eleven jobs of road improvement, cost about \$8,665.....	W. H. Holz, Auditor
Ia.	Wapello.....	11 a.m., July	15..County road grading.....	H. W. Baker, Aud.
Tex.	Cameron.....	July	15..Macadam gravel and concrete road, to cost about \$150,000..	J. C. Field Eng. Co., Denison
Minn.	Buffalo.....	2 p.m., July	15..Grading and gravelling two roads.....	J. A. Berg, Co. Aud.
N. Y.	Ithaca.....	4 p.m., July	15..Constructing brick pavement; alternate bids for conc..	O. E. Kerr, City Clerk
Miss.	Tupelo.....	noon, July	16..Furnishing and constructing culverts and surfacing either with gravel or concrete about 47 miles of h'way..	E. W. Robins, Hwy. Comr.
O.	Cincinnati.....	Noon, July	17..Constructing three miles of road.....	County Commissioners
Minn.	Alexandria.....	10 a.m., July	17..Three jobs of state road work.....	E. J. Brandt, Co. Auditor
Wis.	Watertown.....	2 p.m., July	17..Improving several sts., consisting of 6,714 sq. yds. reinforced conc.; 4,371 ft. of combined conc. curb & gutter.	Board of Public Works
O.	Cleveland.....	10 a.m., July	18..Constructing embankment.....	County Commissioners
Ind.	Shelbyville.....	11 a.m., July	18..Grading, draining & graveling highways in two counties.	Comrs. of Decatur & Shelby County
Pa.	Harrisburg.....	July	21..Constructing highways of brick, asphaltic bituminous macadam and other materials.....	State Hwy. Dept.
Ind.	Gary.....	July	22..5,590 sq. yds. macadam, 8,686 sq. yds. brick, 4,470 sq. yds. concrete, 8,260 sq. yds. of sidewalk, cost \$52,975; oiling streets, requiring 50,000 gals. of oil, cost \$8,530.....	W. J. Fulton, City Engr.
O.	Columbus.....	July	23..Improving and macadamizing several streets.....	J. Scott, Clk. of Board.
Ind.	South Bend.....	11 a.m., July	30..3,700 ft. of gravel road improvement.....	C. Sedgwick, Co. Aud.
O.	Massillon.....	Aug.	4..Paving one road, cost about \$100,000.....	State Hwy. Dept., Columbus
Minn.	St. Paul.....	2 p.m., Aug.	6..Excavating machinery, fitted with orange peel bucket..	C. L. Potter, Lieut.-Col. Engr. U. S. A.
SEWERAGE				
Ia.	Mason City.....	July	5..7,400 ft. 30, 20 and 10-in. vit. sewer pipe.....	J. Staunton, Mayor.
Ill.	Elgin.....	July	6..37,000 ft. 6-15-in. sanitary sewer.....	M. H. Brightman, C. E.
Mont.	Choteau.....	July	6..3.2 miles sanitary sewers.....	A. L. Powers, Town Clk.
N. D.	Park River.....	July	6..Laying 2,000 ft. of mains.....	City Council.
Neb.	David City.....	July	6..Furnishing deep well pump, double or single acting....	L. I. Thompson, City Clk.
Wis.	Reedsburg.....	July	6..Constructing lateral sewers in two streets.....	W. H. Diedken, City Clk.
Tex.	San Antonio.....	4 p.m., July	6..Constructing storm and sanitary sewers.....	H. Helland, City Engr.
Mont.	Choteau.....	6 p.m., July	6..Sanitary sewer and disposal plant (see proposal ad)....	S. L. Powers, Town Clerk
N. J.	Plainfield.....	July	6..Constructing sanitary sewers.....	J. P. McMurray, City Clk.
N. Y.	White Plains.....	8 p.m., July	6..Constructing lateral sewer.....	J. J. Brown, Pres.
Neb.	Fremont.....	7.30 p.m., July	6..Constructing sanitary sewer.....	J. Gumb, Chr. B. P. W.
Minn.	Marble.....	8 p.m., July	6..Constructing & laying extension of sewer & wtr. system.	R. S. Curran, Vil. Clerk
Mo.	Jefferson.....	8 p.m., July	6..Constructing sewer.....	P. C. Harding, City Engr.
Cal.	Stockton.....	10 a.m., July	7..Constructing 6-inch vit. clay pipe sewer.....	L. F. Kuhn, City Clerk
N. Y.	N. Y., Richmond.....	Noon, July	7..Constructing a temporary combined sewer with necessary appurtenances.....	C. J. McCormick, Pres.
Wis.	New London.....	8 p.m., July	7..Sewers in several streets.....	C. J. Thompson, City Clk.
Md.	Frederick.....	11 a.m., July	7..850 ft. 6 to 18-inch sewer.....	L. H. Fraley, Mayor
O.	Sandusky.....	Noon, July	7..Sewage treatment plant.....	J. J. Molter, Dir. Pub. Serv.
Conn.	Hartford.....	July	7..Intercepting sewer.....	Board Contract & Supply.
Minn.	Stillwater.....	July	7..2,900 ft. vit. pipe for sewers.....	L. W. Clark, City Engr.
O.	Cleveland.....	Noon, July	8..Furnishing and installing mechanical self-cleaning screen (see proposal ad).....	Comr. Purchases & Supplies
Mass.	New Bedford.....	8 p.m., July	8..Centrifugal pumps and motors for intercepting sewer system.....	W. F. Williams, Cons. Engr.
O.	Marion.....	Noon, July	8..Constructing sanitary sewer and cellar drain.....	H. C. Cass, Dir. P. S.
Minn.	Bemidji.....	11 a.m., July	8..Constructing a judicial ditch.....	D. J. Bourgeois, Engineer
N. Y.	Brooklyn.....	11 a.m., July	8..Constructing sewer basin.....	L. H. Pounds, Boro. Pres.
N. Y.	N. Y., Queens.....	10 a.m., July	8..Constructing a temporary drain.....	M. E. Connolly, Pres.
Cal.	Oakland.....	11 a.m., July	9..Sewer constructing.....	F. M. Smith, City Clerk
Ia.	Wapello.....	8 p.m., July	9..Constructing either vit. or concrete pipe combination storm and sanitary sewer.....	City Recorder
N. D.	Carrington.....	7.35 p.m., July	10..Extension of sewer mains.....	G. W. Heinmiller, City Engr.
Kan.	Eldorado.....	July	10..100 ft. 12-inch and 18-inch storm sewer.....	B. F. Allenbach, City Clk.
S. D.	Aberdeen.....	10 a.m., July	13..1,465 ft. of eight-inch sewers and two manholes.....	F. W. Raymond, City Aud.
Ia.	Waterloo.....	7.30 p.m., July	13..Constructing main sewers.....	City Clerk
Ia.	Guthrie Centre.....	July	14..Sewer work to cost about \$3,700.....	3 Weeks, City Clk.
D. C.	Washington.....	2 p.m., July	14..Furnishing and delivering electrically-operated centrifugal sewage pumps.....	District Comms.
N. J.	Newark.....	2 p.m., July	14..Construction Section 12 of main intercepting sewer.....	Passaic Valley Sew. Com.
O.	Sandusky.....	Aug.	14..Constructing one mile ditch.....	L. A. Schultz, Engr.
O.	Steubenville.....	Noon, July	14..Constructing sewers.....	County Commissioners
O.	Columbus.....	Noon, July	14..Constructing sewage disposal plant & system of sanitary sewers.....	County Commissioners
Neb.	Stanton.....	8 p.m., July	14..Sewer work.....	W. T. McFarland, City Clk.
Fla.	Daytona.....	July	15..21 miles 8-24-inch vit. pipe sewer, 430 tons c. i. pipe, 16,000 ft. galv. iron pipe, etc.....	Bd. Pub. Works
Ia.	Fort Dodge.....	July	15..1,500 ft. 8-in. vit. pipe sewer, and 1,766 ft. 8-in. vit. pipe sewer in another street.....	J. Ford, Mayor
Mont.	Havre.....	8 p.m., July	20..Constructing five miles of sewer, filtration and disposal plant.....	S. L. Hanley, City Engr.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Md., Kensington	July 23	Sewer and water system costing \$50,000.....	H. W. Hutton, Engr., Wil- mington, Del.
Ind., Hammond	10 a.m., July 31	12-inch vit. socket pipe sewer.....	Board Public Works
WATER SUPPLY.				
Panama	July	6.. C-i. pipe fittings, valves, etc.....	Gen. Pur. off., Wash., D. C.
Ia., Perry	July	6.. Furnishing and laying 2,000 ft. of 4-inch main.....	City Clerk
Neb., Herman	Noon, July	6.. Constructing waterworks system complete.....	Village Board Trustees
Ia., Keystone	Noon, July	6.. Extending waterworks system.....	G. Harder, Town Clerk
Wis., Oshkosh	3 p.m., July	6.. Installing bubbling fountains in school.....	Board Public Works
D. C., Washington	10.30 a.m., July	6.. Cast-iron pipe, fittings, etc.....	Maj. F. C. Boggs, Gen. Pur. Off., Isthmian Can. Comm.
Minn., Fergus Falls	2 p.m., July	6.. Constructing 600,000-gal. concrete reservoir.....	State Bd. of Control, St. Paul
Neb., David City	7.30 p.m., July	6.. Furnishing deep well pump, double or single acting.....	L. L. Thompson, City Clk.
O., Columbus	Noon, July	7.. Supplying various items for alum plant.....	S. A. Kinnear, Dir. P. S.
N. J., Harrison	9 p.m., July	7.. Supplying 4,500 ft. of 16-in. c. i. wtr. pipe, excavating trenches and laying same, etc.....	C. T. Van Deren, Chm. Water Com.
N. Y., New York	2 p.m., July	8.. Cleaning water mains and setting additional valves, etc.....	W. Williams, Comr. Wtr. Sup.
Ill., Chicago	11 a.m., July	8.. Laying water service pipes and sewers.....	Board Local Improvements
W. Va., Wheeling	July	9.. Installing filtration plant.....	Johnson & Fuller, Engrs, 150 Nassau St., N. Y.
S. D., Humboldt	July	10.. Constructing water works, cost \$10,000.....	S. Edmunds, Engr., Yankton.
N. D., Carrington	7.35 p.m., July	10.. Extending water mains.....	H. L. Winterer, City Clk.
N. Y., New York	11 a.m., July	14.. Roofing with reinforced concrete tile 46 superstructures along Catskill aqueduct.....	Comrs. Water Supply, Mu- nicipal Bldg.
Tenn., Memphis	Noon, July	14.. Supplying pumping station and equipment.....	C. C. Pashey, City Clk.
N. M., Hagerman	July	15.. Constructing water works system.....	Town Clerk.
S. D., Tripp	July	15.. Sewers and sewage treatment plant.....	Dakota Engrg. Co., Mitchell
N. Y., Hudson	7.30 p.m., July	22.. Waterproofing wall and constructing 6-in. reinforced cut-off wall.....	M. J. O'Hara, City Engr.
O., Cleveland	Noon, July	23.. Constructing a concrete coagulant house and wash water reservoir. (See Proposal ad.).....	A. R. Callow, Comr. Pub. & Supplies.
Neb., Dalton	Aug. 27	27.. Constructing water works, cost \$7,200.....	J. L. Willis, Village Clk.
LIGHTING AND POWER.				
O., Seville	Noon, July	6.. Erecting and completing electric light distribution sys- tem.....	S. D. Hall, Village Clerk.
Ariz., Tucson	4 p.m., July	6.. 60 5-light and 26 1-light ornamental street lighting standards, with globes or bulbs.....	L. O. Cowan, City Clerk.
Md., Easton	noon, July	8.. Engine, generators and power plant equipment.....	C. H. Henry, Sec. Easton Elec. Commission
N. Y., New York	2 p.m., July	8.. Furnishing, delivering and erecting electric transmis- sion lines in Richmond.....	W. Williams, Comr. Wtr. Sup.
Mont., Billings	July	10.. Constructing power building.....	Linken Haire, Architect
Ill., Chicago	11 a.m., July	10.. 100,000 ft. of duplex rubber-covered wire.....	R. Palmer, Comr. Gas & Elec.
Colo., Las Animas	July	11.. Furnishing and installing four 100-h. p. water tube boil- ers, fan and motor valves, piping, etc.....	Bur. Yards & Docks, Navy Dept., Wash., D. C.
Pa., Tarentum	July	13.. Reinforced concrete power house.....	Borough Council.
La., New Orleans	Noon, July	30.. Wire and cable for drainage system.....	Sewerage & Water Board.
O., Mansfield	Aug.	1.. Furnishing electric light for city.....	O. Hursh, Dir. of Service
FIRE EQUIPMENT.				
Ill., Blue Island	July	6.. 1,000 ft. of hose, hose jackets, clamps, etc.....	F. Hohmann, City Clerk.
Cal., Fresno	July	6.. One motor hose wagon, steamer tractor, and chassis for two hose wagons.....	Board Trustees.
Ariz., Douglas	8 p.m., July	6.. Furnishing 500 ft. of 2½-inch cotton fire hose.....	J. A. Howell, City Clerk.
Fla., Jacksonville	8 p.m., July	6.. Furnishing 2,500 ft. 2½-inch rubber-lined fire cotton hose.....	F. Richardson, Chr. Bd. Bond. Trustees.
N. C., Wilmington	Noon, July	7.. Furnishing one motor-driven fire pump of 1,400 gallons per minute capacity for fire boat.....	W. F. Jones, Councilman of Public Safety.
Pa., Erie	10.30 a.m., July	9.. One motor-driven 85-ft. self-raising hook & lad. truck.....	J. C. Dundom, Supt. Dept. Pub. Service
Mont., Kalispel	July	10.. Supplying motor apparatus.....	P. R. Neilson, Chief
N. J., Wallington	8 p.m., July	13.. Furnishing a fire alarm telegraph system.....	N. O. Berry, Boro. Clerk
Mont., Kalispel	July	15.. One motor-driven triple combination wagon.....	City Clerk.
Mont., Havre	8 p.m., July	20.. Furnishing combination hose and chemical motor car.....	S. L. Hanley, City Engr.
BRIDGES.				
Ind., Hartford City	2 p.m., July	6.. Furnishing all material and constructing a cement con- crete culvert.....	Cronin, Jr. Aud. County.
N. J., Hackensack	1 p.m., July	6.. Constructing one bridge.....	Bd. Chosen Freeholders.
Cal., San Luis Obispo	7 p.m., July	6.. Constructing reinforced concrete bridge.....	Fed. Engrs. Co., Los Angeles
Ky., Louisville	2 p.m., July	7.. Reinforced concrete arch bridge.....	Board Public Works
Minn., Stillwater	July	7.. Constructing concrete bridge.....	L. W. Park, City Engr.
Pa., Wilkes-Barre	July	7.. Reinforced concrete viaduct.....	City Clerk.
Ind., Boonville	2 p.m., July	7.. Constructing 15 bridges.....	Co. Comrs.
Ont., Toronto	Noon, July	7.. Concrete retaining wall, bridge floor and conc. abutment.....	Board Control
Pa., Uniontown	Noon, July	8.. Constructing reinforced concrete bridge.....	H. Kisinger, Co. Cont.
Mo., Athol	11 a.m., July	9.. Constructing reinforced concrete bridge.....	Jackson Co. Court, Kansas City.
Ind., Indianapolis	10 a.m., July	10.. Two flat top culverts.....	County Commissioners
Kan., Washington	Noon, July	10.. Constructing 13 bridges, 20 to 50 ft. in length.....	F. E. McKelby, Co. Clk.
Ariz., Phoenix	Noon, July	13.. Constructing 25-ft. span reinforced concrete bridge.....	J. Miller, Jr., Clk. Bd. Supv.
N. J., Perth Amboy	2.30 p.m., July	13.. Constructing steel and concrete culvert.....	Bd. Chosen Freeholders, New Brunswick.
Pa., Johnston	noon, July	14.. Constructing several reinforced concrete bridges.....	C. G. Campbell, Co. Cont.
O., New Philadelphia	July	15.. Constructing a 100-ft. concrete arch bridge.....	R. H. Misstoffer, Aud.
MISCELLANEOUS.				
Pa., Allentown	4 p.m., July	6.. Constructing concrete wall and refitting playgrounds.....	G. P. Wenner, Secv. School Bd.
D. C., Washington	10.30 a.m., July	6.. Furnishing c. i. pipe, fittings, valves, etc.....	Maj. F. C. Boggs, Gen. Pur. Off., Isthmian Canal Comm.
N. J., Bloomfield	8 p.m., July	6.. Eight-room fireproof school building, cost \$45,000.....	Board of Education
Fla., Jacksonville	8 p.m., July	6.. Furnishing \$750 automobile.....	Board Bond Trustees
O., Cincinnati	July	7.. Furnishing and delivering 7,000 bbls. Portland cement.....	Purchasing Agent.
Ia., Muscatine	2.30 p.m., July	8.. Furnishing all material and constructing fireproof City Hall.....	Bureau Yds. and Docks, Navy Dept., Wash., D. C.
N. H., Portsmouth	July	11.. Furnishing and installing after-cooler.....	C. W. Handman, Bus. Mgr.
O., Cincinnati	Noon, July	13.. Constructing concrete retaining wall.....	M. J. Douthitt, C. E.
Ill., Waukegan	5 p.m., July	13.. Furnishing 360 street signs.....	A. I. Webster, City Clerk
N. J., East Orange	8 p.m., July	13.. Furnishing auto truck for sewer dept., 3-ton capacity.....	C. P. Parker, Dir. P. S.
O., Akron	Noon, July	14.. Buildings for garbage reduction work.....	
N. Y., Hudson	7.30 p.m., July	22.. Furnishing material and labor for waterproofing old wall and constructing 6-in. reinforced concrete cutoff wall. (See proposal ad.).....	M. J. O'Hara, City Eng.
Cal., Los Angeles	July	22.. Furnishing materials and erecting riveted steel pipe.....	U. S. Reclam. Service
Ia., Le Mars	3 p.m., July	23.. Constructing complete post office.....	Wenderoth, Sup. Arch., Treasury Dept., Wash., D. C.
Ind., Gary	3 p.m., Aug.	6.. Constructing two-story post office.....	O. Wenderoth, Sup. Architect, Treasury Dept., Washington.

STREETS AND ROADS

Jasper, Ala.—Walker County is arousing great enthusiasm in regard to subject of good roads. On July 13 voters of this county will hold an election to vote on bond issue of \$30,000.

Prescott, Ark.—A movement to build 120 miles of macadam roads in Nevada County has been launched by Nevada County Goods Roads Association. It is planned to organize gigantic improvement district and float \$300,000 in bonds to raise funds to make improvements. It is believed that roads can be constructed for \$2,500 a mile.

Richmond, Cal.—The biggest piece of street paving in this city since improvement of Macdonald Ave. has been ordered when City Council took necessary steps for paving of Cutting Blvd. with asphalt. This boulevard is 110 ft. wide and is to be paved distance of 30 blocks, from Richmond Ave. to Pullman works. Clear space will be left in the center for construction of the Southern Pacific electric line.

Sacramento, Cal.—All of \$3,000,000 State highway bonds advertised for sale have been disposed of at par and accrued interest at sale held by State Treasurer E. D. Roberts. This brings total sale of highway bonds up to \$12,988,000. Bonds were disposed of as follows: Mendocino, \$75,000; Yuba, \$40,000; Humboldt, \$150,000; Los Angeles, \$100,000; Kern, \$180,000; while the Board of Control bid in the remainder of the \$3,000,000 issue. W. W. Bassett, of Capital National Bank, took on behalf of Tehama County \$18,000 of bonds of undisposed lot of \$30,000.

San Francisco, Cal.—Paving of Junipero Serra Blvd. from Ocean Ave. to county line will be completed in few months.

Stockton, Cal.—According to recent decision made by supervisors of this county, roads in vicinity of Manteca, Lathrop and Ripon are to be oiled this summer. Bids for work will be received July 7.

Truckee, Cal.—Road around Lake Tahoe connecting all watering places will probably be outcome of conference between Supervisors of Placer County and Nevada Good Road Boosters from Reno.

New Castle, Del.—The New Castle County Levy Court has awarded to Harris, Forbes & Co., of New York, \$100,000 4½ per cent. highway bonds and \$200,000 4½ per cent. building commission bonds.

St. Augustine, Fla.—At meeting of County Commissioners of St. Johns County, Heard National Bank of Jacksonville purchased entire \$650,000 bond issue, recently authorized there, for good roads, premium on bonds being \$2,100.

Champaign, Ill.—Bids will be received until 2 p. m., June 26, for following improvements: Excavation, 2,500 cu. yds.; removing brick in old pavement (two layers), 13,338 sq. yds.; reinforced concrete pavement, including the reinforcing and expansion joints with steel protection plates and filler, 16,818 sq. yds.; brick pavement on 6-in. concrete foundation with 2-in. sand cushion and asphalt filler, 3,123 sq. yds.; concrete curb, 8,614 lin. ft.; concrete retaining curb, 419 ft.; stone false curb, set 30 lin. ft.; stone false curb, reset, 30 lin. ft.; cast iron gutter plates, 20 pieces; 13 Style A catch basins, average depth, 6.1 ft.; 1 Style C catch basin, depth 7 ft.; 1 curb Inlet No. 6, set in place; 3 curb inlets, not set in place; 10 rings for Style C catch basin, set in place; 2 covers for Style A catch basin, set in place; 2 inlet grates, reset; steel in bridges, 1,308 lbs.; concrete in bridge, 45 cu. yds.; 24-in. vitrified tile drain, average cut 4.2 ft., 608 lin. ft. 18-in. vitrified tile drain, average cut 3.4 ft., 376 lin. ft.; 15-in. vitrified tile drain, average cut, 9 ft., 48 lin. ft.; 12-in. vitrified tile drain, average cut, 4 ft., 64 lin. ft.; 10-in. vitrified tile drain, average cut, 5.3 ft., 952 lin. ft.; 8-in. vitrified tile drain average cut 4.6 ft., 320 lin. ft. L. A. Glenn is City Auditor.

Chicago, Ill.—County Board has made recommendation to state highway commission that Cook county roads improved this year under state-aid law be built of concrete.

Springfield, Ill.—Plans for improvement of roads in Adams, Woodford, Stark, Madison, Kane, DuPage, Tazewell, Lawrence and Menard counties have been sent out by State Highway Commission. When approved by county boards in these districts, contracts for road construction will be let. Twenty-one counties were provided for last week.

Columbia City, Ind.—City Council has decided to pave alleys in 17 blocks in

business and central residence districts. Contract will be let in near future.

Fort Wayne, Ind.—County Commissioners have conferred with commissioners of Noble County regarding county line road between Eel River and Swan Townships. Road is six miles long and town of Ari is directly in center of stretch, making longest haul of materials only three miles from Vandalia siding at that village. Bids will be advertised for on July 20.

Fort Wayne, Ind.—County Treasurer Bueter will on July 15 sell road bonds to value of \$93,200. These bonds are for building of Allen County's three first concrete roads, two New Haven and Portage Ave. roads.

Indianapolis, Ind.—Resolution and specifications for paving of East New York St. from Arsenal Ave. to Belt railway tracks have been adopted by Board of Public Works. Estimated cost, based on wooden block material, is about \$75,000. If pavement is built it will give new paved roadway from downtown district to Irvington, East New York St. from Belt railway tracks to Emerson Ave. having been paved about two years ago.

Kokomo, Ind.—Bids will be received at office of County Treasurer of Howard County, Indiana, in Court House in city of Kokomo, Ind., up to 10 o'clock a. m., July 7, 1914 for purchase of following series of free gravel road bonds bearing 4½ per cent. interest per annum, described as follows, to-wit: No. 5260—Theodore G. Kratzer Road, Howard Township, 20 bonds at \$620 each, \$12,400; No. 5280—William Langley Road, Taylor Township, 20 bonds at \$880 each, \$17,600; No. 5386—Otis Hormel Road, Center Township, 20 bonds at \$1,204 each, \$24,080; No. 5466—T. A. Ruse Road, Center Township, 20 bonds at \$2,280 each, \$45,600; No. 5484—W. W. Drinkwater Road, Center Township, 20 bonds at \$984 each, \$19,680. Larry Ryan is Treasurer.

Plymouth, Ind.—Union Township gravel road bonds have been sold to C. A. Reeve of Plymouth for \$74,281.

Leavenworth, Kan.—Estimates presented by City Engineer Franks for paving east and west alley between Second and Third and Arch and Vine Sts. have been accepted. Two estimates were given, one \$1.15 for paving and another \$1.05. The \$1.05 estimate provides for use of brick that will not be forced to withstand as severe a test in new rattler. Both kind of brick will be tried out.

Louisville, Ky.—City Engineer Lyman has been authorized by Board of Public Works to reconstruct two alleys, one from Green to Walnut, between 2nd and 3d Sts., and connecting alley, south of Green on 3d, running east to first mentioned alley. Material used will be concrete and cost will approximate \$1,400.

Cumberland, Md.—Special election will be held July 14 for voting on \$150,000 bond issue for paving streets within limit of city. T. W. Koon is Mayor and A. W. Straub is City Clerk.

Beverly, Mass.—Beverly is planning for smooth paving on Cabot and Rantoul Sts.

Boston, Mass.—Council has adopted loan order for \$42,100 for widening of Washington st., between Warrenton and Pleasant sts.

Lawrence, Mass.—To banking firm of R. L. Day & Co., of Boston, contract on \$250,000 paving loan bonds with bid offering premium of \$5.90 per thousand.

North Adams, Mass.—The Massachusetts Highway Commission has asked for bids on building of state road from Williamstown to South Williamstown. Sum available for this purpose is \$18,000 and if this amount is not sufficient to do work under consideration, the \$10,000 appropriated last year will also be used, making total expenditure of \$28,000.

Sault Ste. Marie, Mich.—Common Council has voted in favor of constructing bitulithic pavement on Portage Ave., from Bingham Ave. to water power canal bridge.

Bozeman, Mont.—Tracy Ave. will shortly be graded and paved; cost, about \$30,400.

Helena, Mont.—County Comrs. will start work this summer on following highways and bridges: Road over Priest Pass, cost \$10,000; 26 steel bridges in northern part of county, \$26,000; bridge at Wolt Creek, \$5,000; bridge on Dearborn River, \$5,000; Marysville Road, \$13,000; Herbert Lans Road, \$5,000.

Manchester, N. H.—Construction of new boulevard along Hanover St. to Auburn line will be started shortly.

Elizabeth, N. J.—Seven concerns have submitted bids for repaving of Westfield Ave., from Bayway, Elizabeth, to Chestnut St., Roselle. The Public Service Railway Co. has agreed to improve street's surface and to elevate its tracks under Lehigh Valley Railroad. Half of cost of repavement of this thoroughfare, which is direct route to Philadelphia for autoists, will come from State funds. Improvement of thoroughfare from Roselle to Plainfield will later be taken up. It has not yet been decided what type of paving will be used, but amiesite has been suggested. Lowest bidder was Bentley Paving Co., Passaic, \$19,122.61 for 250 lbs. to sq. yd., and \$20,774.81 for 300 lbs. to sq. yd. Contract will be awarded in a few days.

New Brunswick, N. J.—Resolution has been passed for advertising for bids for building of second section of Roosevelt-Woodbridge road.

Plainfield, N. J.—Following are bids received for road work: Humphrey & Bentley Paving Co., of Passaic, \$19,122.61 for 250 lbs. to the sq. yd., and \$20,774.81 for 300 lbs. to the sq. yd. Burke & Bonham, of Plainfield, \$22,031.21 on 300 lbs. to the sq. yd. J. F. Shanley & Co., of Newark, \$21,781.05 on 300 lbs. to the sq. yd. Uvalde Asphalt Paving Co., of New York, \$22,539.09 on 300 lbs. to the sq. yd. Weldon Contracting Co., of Linden, \$23,275.57 on 300 lbs. to the sq. yd. C. H. Winans & Co., of Linden, \$18,639.88 on 250 lbs. and \$20,492.28 on 300 lbs. to the sq. yd. Charles Lentz, of Roselle, \$26,083.81 on 300 lbs. and \$22,228.81 on 250 lbs. to the sq. yd.

Brooklyn, N. Y.—Board of Estimate has passed all of authorizations for public improvements laid over, which include sixteen preliminary authorizations for Brooklyn, total estimated cost of which is \$81,400, and nine final authorizations, estimated cost \$137,900; total for Brooklyn, \$219,900. There were seven preliminary authorizations for Queens, estimated cost, \$90,700, and eight final, estimated cost, \$90,600; total for Queens, \$181,300—total for two Long Island boroughs of \$400,600. Most important final authorization for Brooklyn is grading 86th St. from Bay Parkway, or 22d Ave., to Gravesend Ave., distance of one and a third miles.

Ithaca, N. Y.—All bids on the Thurston Ave. paving job have been rejected, Board deciding that they were all too high. New bids will be invited, bids to be returnable July 15.

Niagara Falls, N. Y.—Repaving of Pine Ave. has been ordered.

Port Chester, N. Y.—Engineer James Duffy has prepared tabulation of bids on paving of portion of Winfield Ave., known as Old White Plains rd. from end of present brick pavement to foot of Lynch's hill. Summary of tabulation follows: Joseph Dimando, brick, \$12,067.00; P. E. Murray, brick, \$12,739.80; Daly & Merritt, brick, \$13,124.50; Daly & Merritt, bitulithic, \$16,447.00; Daly & Merritt, concrete, \$8,694.50. Warren Brothers, various forms of bitulithic, from \$10,678.20 to \$11,475.60. Amiesite Co., Amiesite, \$8,736.70.

Port Jervis, N. Y.—Bids for paving Jersey avenue have been opened by Common Council, but awarding of contract was deferred. Collier and Cuddeback are lowest bidders on Mack brick and Port Jervis Construction Co. are the lowest on Bessimer, both of which are under consideration. Bids were as follows: Thompson Worcester Co., Clearfield brick, \$2.43 per square yard; Paterson, \$2.49; American or Porter, \$2.46; Mack, \$2.49; Foster, \$2.51; Bessimer, \$2.55; Metropolitan, \$2.56. Excavation per cubic yard, 60 cents; four feet radius, \$4; two feet, \$2; eighteen inches radius, \$2; protection curbing, 35 cents a foot; new curbing, 65 cents; resetting, 35 cents. Progressive Realty Company of Southerton, Pa., Mack, \$2.37; Clearfield, \$2.25; excavation, 30 cents; four feet radius, \$2.50; two feet, \$1.50; eighteen inches, \$1.25; protection curbing, 30 cents; new curbing, 50 cents; resetting, 20 cents. A. D. Osborn of Binghamton, Metropolitan Wire Cut, \$2.56; Metropolitan Repressed, \$2.55; Bessimer, \$2.53; Clearfield, \$2.40; American, \$2.46; Porter, \$2.46; Paterson, \$2.49; Deckman, \$2.59; Mack, \$2.49; Foster, \$2.47; excavation, 60 cents; four feet radius, \$5; two feet, \$2.75; eighteen inch, \$2.00; protection curbing, 75 cents; new curbing, 55 cents; resetting, 25 cents. W. J. Collier and B. E. Cuddeback, Clearfield, \$2.22; Paterson, \$2.19; American, \$2.21; Porter, \$2.21; Mack, \$2.17; excavation, 39 cents; four feet radius, \$4.85; two feet radius, \$2.15; eighteen inches, \$1.20; protection curbing, 35 cents; new curbing, 59 cents; resetting, 35 cents. Port Jervis Construction Co., Deckman, \$2.35; Bessimer,

\$2.34; Mayer, \$2.35; Mack, \$2.26; American and Porter, \$2.32; Paterson, \$2.35; excavation, 50 cents; four feet radius, ten cents; two feet, ten cents; eighteen inches, ten cents; protection curbing, \$1; new curbing, 45 cents; resetting, 15 cents. George H. Worden, new curbing, 59 cents; resetting, 29 cents.

Schenectady, N. Y.—Paving of Yorkston st. has been ordered.

Tonawanda, N. Y.—The Tonawanda Common Council has sold \$19,000 worth of sewer bonds and \$16,000 worth of street paving bonds to Spitzer-Rorwick Co., of New York.

Greensboro, N. C.—Resolution has been adopted for paving of Church and Davie Sts., and Summit Ave. J. S. Michaux is City Clk.

Altoona, Pa.—Ordinances have been presented for paving with vitrified brick of five gaps in street paving in various sections of city. Ordinances for paving of 24th St., between Ninth and West Chestnut Aves., Chestnut Ave. and between First St. and eastern city line, Washington Ave., from 22nd Ave. to city line, 14th St., between 11th and 13th Aves., and 15th St., between 11th and 13th Aves.

Cleveland, O.—Cuyahoga county will add 60 miles of rural brick road to its 400 miles of similar pavement, according to 1914 road improvement plans announced by County Engineer Stinchcomb, thus strengthening its distinction of being best paved rural district of any similar area in world. Minimum width of 16 ft. has been adopted for roads to be laid during coming summer and entire expenditure, including fills, bridges, etc., will be somewhat in excess of \$900,000.

Columbus, O.—Bids will be received at office of Board of County Commissioners of Franklin county until 10 a. m., July 16, for purchase of county road improvement bonds. John Scott is clerk of board.

Girard, O.—Ordinance declaring it necessary to pave Prospect St. from west side of North Ave. to eastern limits of the village has been passed under suspension of rules.

Niles, O.—A \$10,000 block of bonds for city's portion of paving various streets have been sold. Will Roth & Co., of Cincinnati, being highest bidder.

Sandusky, O.—About \$30,000 will be spent this year on road improvements.

Youngstown, O.—Bids will be received until 2 p. m., July 20, for purchase of paving bonds. D. J. Jones is city auditor.

Youngstown, O.—Good Roads Commissioners have authorized issue of \$60,000 additional bonds, bids to be opened Monday, July 20. These bonds are to create fund to pay road district's share of paving road from Austintown center to North Jackson with brick.

Eugene, Ore.—Campaign for better sidewalks has been started by Eugene city council, and first move is extension of cement walk district.

Arlington, Pa.—Township will borrow \$10,000 and spend \$3,000 on oiling of roads.

Connellsville, Pa.—Acting upon petition presented by six property owners on Cottage Ave., between Apple St. and East Main St., Council has decided to inaugurate series of permanent improvements under \$100,000 bond issue by paving that section with concrete. Ordinances will be drawn up and bids asked for so as to get work under way as soon as possible.

Dubois, Pa.—Paving of Maple Ave. and Main St. is being planned.

Erie, Pa.—City engineer has been authorized to advertise for bids on proposed paving of 24th St. between Parade and Ash, and Chestnut St. between 18th and 22d.

Harrisburg, Pa.—State Highway Department has advertised for bids on State aid contracts throughout Commonwealth to close on July 21. These contracts for road construction are all part of State-aid system of road building and are not dependent upon automobile taxation money which is withheld from department by action of Auditor General and State Treasurer. In bids advertised there is one in Ridgway Borough, Elk County, where more than a mile of brick block pavement of standard width of 16 ft. is to be constructed from intersection of Main and Depot sts., by way of Depot and Front sts., to the east borough line. Five thousand feet of highway is to be constructed in Milford township, Somerset County, running from Rockwood Borough line in northerly direction along Cox's Creek. On this highway alternate bids will be received on water-

bound macadam and asphaltic bituminous macadam, penetration method. Approximately mile of asphaltic bituminous macadam, penetration method, highway is to be constructed in Summit township, Somerset County, running from east borough line of Meyersdale in easterly direction. In Blossburg Borough, Tioga County, nearly two miles of brick block pavement is to be constructed running from bridge over Tioga River by way of Williamson road to line separating Blossburg Borough from Hamilton township, and thence over Williamson road by way of Carpenter st. to Erie Railroad tracks. Fifteen thousand, four hundred and fifty ft. of water-bound macadam highway is to be built from southern end of Leechburg Bridge to village of Deronda in Allegheny township, Westmoreland County. July 1, 1915, is date set for completion of this work. A 14-ft. brick block pavement nearly 3,000 ft. long is to be built from Sugar Creek-Jackson township line to Shaw Bridge, over Sugar Creek in Jackson township, Venango County. This highway differs from nearly all of others constructed by State Highway Department, in that it is only 14 ft. in width instead of 16 ft. A brick highway now in use in Franklin township, Greene County, is to be extended about 15,000 ft. from southerly end present pavement in southerly direction on Smith Creek road to end of the macadam road. In Bristol township, Bucks County, the Creek road extending from Croydon station on New York Division of Pennsylvania Railroad to Newportville Rd., distance of approximately a mile, is to be repaired. Alternate bids will be received on Amiesite, Filbertine, Warrenite, Unionite and asphaltic bituminous macadam, penetration method. Twelve thousand ft. of highway running from Sellersville Borough line south to Derstines' mill, and thence westerly to Telford Borough line in West Rockhill township and Telford Borough, Bucks County, is to be completed by July 1, 1915. Alternate bids will be received on Amiesite, Filbertine, Warrenite, Unionite and asphaltic bituminous macadam, penetration method.

Johnstown, Pa.—Council has placed on calendar ordinances providing for asphalt paving on following thoroughfares: Fifth ave., Power to McConaughy st.; Linden ave., Ohio to Lunen st.; McMillen st., J. & S. tracks to Oak st.; Pine st., Messenger to Murdock; Ash st., Golde to Messenger; Oak st., Messenger to Solomon Run; Griffith and Du Pont sts., Central to Grove.

Philadelphia, Pa.—Resolutions asking that Germantown Ave. be paved between York St. and Allegheny Ave., and asking that Broad St. subway be extended to Olney Ave., are being considered.

Williamsport, Pa.—Bids will be re-advertised for paving of St. Boniface St. and Louisa St.; also for resurfacing of West Third St.

Williamsport, Pa.—Ordinance is expected to be presented at next regular session of Council providing for pavement of approximately 7,000 ft. of street in western part of city.

Yankton, S. D.—Paving of 3d St. with concrete about 18,000 sq. yds. with 3,600 lin. ft. curb, clay foundation, is being considered. Stanley H. Edmunds is City Engineer.

Ennis, Tex.—Election has been ordered on \$90,000 road bond issue for Road District No. 10 of Ellis county for July 18. Voting boxes in proposed district are Bristol, Crisp, Tellico and Leland.

Mason, Tex.—A road tax election for Mason county has been ordered to be held Tuesday, July 7. Money, if voted, will be partly used to build concrete crossings over various streams in the county.

San Antonio, Tex.—Paving bids on 78 streets have been opened, involving 700,000 sq. yds. of pavement. Bids have been referred to City Engineer for tabulation and report.

Waco, Tex.—All bids for construction of approximately 175 miles of good roads and number of bridges in Justice Precincts 1 and 3 have been declared off at meeting of County Commissioners and Advisory Board. It was decided to receive new bids. Only two concerns bid on the roads and bridges, as follows: Richard Morey, St. Louis, roads, \$807,068.95; bridges, \$120,626.74. Roach-Minggan Paving Co., Memphis, roads, \$775,769.67; bridges, \$147,129.85.

Whitsett, Tex.—Commissioners of Live Oak County have ordered election to be held in August to vote on \$100,000 bond issue for road and bridge improve-

ments for county. There will be election in this precinct June 27 to vote on \$40,000 bond issue for same purpose. If both elections carries this will give this precinct \$140,000 for improvement of roads and bridges, which are very badly needed.

Benwood, W. Va.—Ordinance has been passed authorizing paving of that section of 18th St. lying between Marshall St. and Ashland Ave., and paving of that section of 20th St. lying between Marshall St. and Ashland Ave., both in the Fifth Ward. Ordinance provides that contract for work may be let in part or as whole or that it may be done by city street commissioner. It will be of brick construction.

CONTRACTS AWARDED.

Mobile, Ala.—To F. G. Proudfoot, of 127 N. Dearborn St., Chicago, Ill., at \$34,844, for construction of asphalt paving.

Oroville, Cal.—Contract for paving fourteen blocks of street in business district of Oroville has been awarded to Clark & Henery Construction Company of San Francisco. Bid of Clark & Henery was \$36,352.50. Rejected bids were as follows: Municipal Improvement Company, \$37,344.50; Ransome-Crummey Company, \$37,871.50; McGilivray Construction Company, \$39,432.50.

Redwood City, Cal.—When Supervisors have awarded contracts for road work amounting to \$108,532, total of road contracts now under way in San Mateo County was brought up to million-dollar mark. The Clark & Henery Construction Co. was lowest bidder for Bay Shore road, from South San Francisco to San Francisco County line. This job was awarded for \$69,329. Section is 4 miles long and specifications call for asphalt, with concrete base. James Willson was awarded contract for construction of ocean boulevard, between Tunitas Glen and San Gregorio. His bid was \$39,193.

Manchester, Conn.—Board of selectmen has awarded contract for about \$16,000 worth of concrete sidewalk and granite curbing to W. F. Potter Co. of North Haven. On important items Mr. Potter bid as follows: Concrete walk, 4 inches deep, 9 cents a sq. ft.; 5-inch drives, 10 cents; 6-inch drives, 11 cents; 7-inch drives, 12 cents; 8-inch drives, 13 cents; granite curbing dressed and set, 65 cents; two-ft. radius corners, \$1.90; setting same, 30 cents.

Jacksonville, Fla.—To Wilson Construction Co. for paving 7,920 lin. ft. of roadway at \$1.38 per sq. yd.

Anna, Ill.—To Granite City Lime & Cement Co., Granite City, Ill., at \$54,081, for construction of 24,150 sq. yds. of brick paving on 5-in. concrete base with sand filler and grouted with cement.

Dixon, Ill.—The Gund-Graham Co. of Freeport was successful in securing two contracts for brick paving at Dixon. Contracting firm will do paving on East River St. at cost of \$16,747.05, and on North 2d St. and Crawford Ave. at cost of \$18,536.21.

Dixon, Ill.—By City Council contracts for improvements as follows: Brick on Central Pl., 5th St., Depot Ave. and 7th St., to Rink & Schnell for \$20,381; concrete on 7th St. and Chicago Rd. to J. W. Kelly, \$9,751; brick paving East 2d St. and on Crawford Ave. to Gund & Graham, Freeport, \$18,536; brick on Fellows St. to Chas. Hughes, Rockford, \$12,167; macadam on East Everett St., East Boyd St. and East Water St., North Crawford Ave. and North Jefferson Ave., to Duffy & Hubbard, \$13,023; macadam, East Chamberlain St. and North Jefferson Ave. to Duffy & Hubbard, \$11,739; brick on East River St. to Gund & Graham, \$16,747.

Edwardsville, Ill.—Albert J. Fahrig of Edwardsville awarded contract for construction of rock roadway on Alton road at cost of \$9,050. He was lowest bidder. Other bidders were: John Adams, of St. Louis, \$11,600; Parham Construction Co., \$10,050; Robert Hyten, \$13,500, and Dunlap-Dippold Construction Co., \$10,520.

Fort Wayne, Ind.—The first tarvia roads in Allen County will be begun soon, as County Commissioners have let contracts for two of them. Contracts went to J. C. O'Connor & Son, lowest bidders on both roads. Reed Road is 9,096 ft. long and estimate was \$16,051, but O'Connor Co. will build it for \$13,959. Lunz Road will be fixed for 15,268 ft. for \$24,295. Estimate was \$28,896. Two roads are really one road, extending from end of Lake Ave. pavement to the Goegelein Corners, 4½ miles northeast of city.

Fort Wayne, Ind.—Bids for first concrete roads to be put down in Allen

County were received by county commissioners. They are for New Haven Roads Nos. 1 and 2 and for Portage Ave. On all three of roads bids of C. W. Jensen Co. were lowest. Bids were as follows: New Haven Road No. 1—C. W. Jensen & Co., \$28,499; J. C. O'Connor & Son, \$25,495; Indiana Engineering Construction Co., \$35,814; Trippier & Son, \$33,056; Brooks Construction Co., \$31,200; Foulkes Construction Co., \$36,394; Davenport & McReynolds, \$32,900; Moellering Construction Co., \$34,900. New Haven Road No. 2—C. W. Jensen & Co., \$16,299; J. C. O'Connor & Son, \$35,495; Indiana Engineering Construction Co., \$21,319; Trippier & Son, \$18,375; Brooks Construction Co., \$18,200; Foulkes Construction Co., \$20,255; Davenport & McReynolds, \$18,455; Moellering Construction Co., \$21,000; A. H. Fry, \$18,123. Portage Ave.—C. W. Jensen & Co., \$22,199; Gallagher & Ryan, \$24,913.25; J. C. O'Connor & Son, \$25,995; Indiana Engineering Construction Co., \$23,672; Trippier & Son, \$23,936; Foulkes Construction Co., \$24,423; Davenport & McReynolds, \$23,192.95; Moellering Construction Co., \$25,000. The New Haven No. 1 road is 13,648 ft. long and the engineer's estimate was \$38,195.60. The cost is \$2.09 per ft. The New Haven No. 2 road is 7,805 ft. long and the estimate was \$22,426. The cost is also \$2.09 per ft. On Portage ave. pavement will be laid for 9,667 ft., the estimate having been made at \$26,788.44. The cost is \$2.29 per ft. The two New Haven roads are in Adams township and the Portage road in Wayne township.

Shelbyville, Ind.—By County Commissioners contract as follows: For improvements on Weinant Road, in Washington Township, to Fatout, on bid of \$7,390. Road is 3 1/4 miles in length. Fatout was also awarded contract for improving Farthing Road in Union Township on bid of \$6,991. He was only bidder. The Farthing Road is 3 miles long. Firm of Goodrich & Carey, composed of J. M. Goodrich, of this city, and Charles Carey, of Fairland, got contract for improving Ray Road, in Brandywine Township, at price of \$3,257.

Galesburg, Ill.—Contract for pavement of Losey St. has been let to P. H. Tiernan of Macomb for sum of \$47,847.50. Mr. Tiernan was lowest in field of five bidders. H. Heckard & Son of Canton were highest bidders with \$49,896. T. W. Keys of La Salle, Ill., was second with \$40,403.50, and J. J. McAuley of this city was third with \$48,080.70. Engineer's estimate on the job was \$51,017.06.

Highland Park, Ill.—By Ed. Local Improv. for grading, draining, curbing and paving with reinforced concrete 18,000 sq. yds. on Sheridan road, to Galitz & Johnson, at \$35,132.

Peoria, Ill.—For paving Monson St., by Ed. Local Improvements to John McAlister at \$20,081.

Delphi, Ind.—Bond issues for Carroll County roads have been sold by County Treasurer William Lesh, the J. F. Wild Co., of Indianapolis, securing all of them as follows: Fred Landis road in Carrollton township, Scott Clark, contractor, bond issue \$6,500, sold for par and accrued interest plus \$47.12 premium; the U. G. Campbell road in Jackson township, Sines & Ferrier, contractors, bond issue \$7,700, sold for par and accrued interest plus \$54.75 premium; the Charles Buckley road in Deer Creek township and city of Delphi, Charles Minnix, contractor, bond issue \$9,200, sold for par and accrued interest plus \$65 premium; the P. W. Stonebraker road in Burlington township, W. P. Thompson, contractor, bond issue \$3,400, sold for par and accrued interest plus \$22.10 premium.

Fort Wayne, Ind.—County Commissioners have let contracts for stoning of two roads. Both of them are in Perry township and working on them will be begun within short time. Roy Rd. will be stoned for length of 12,997 ft. by C. W. North on his bid of \$13,300. Estimate was \$15,127. Corbin Rd. will be stoned for 13,056 ft. by A. P. Addington on his bid of \$12,725. Estimate on this was \$14,267.94.

Richmond, Ind.—Board has awarded contract for concreting alley between North B and C sts., from 12th to 13th sts., to Schneider Bros. on a bid of 10 3/4 cents per sq. ft., and contract for concreting alley between West Main and A sts., from 5th to 7th, to Nolte & Thompson, on bid of 12 3/4 cents.

Norway, Mich.—By City Council for paving Nelson St. with crushed rock bituminous macadam by Byron W. Hicks, Vulcan, at \$7,300.

Marshall Minn.—By County Comrs. for constructing State rural highway 54, as follows: To Frederick & Barnard, Globe Bldg., Minneapolis, for grading, turnpiking and corrugated culverts, at \$22,999; and to H. P. Fulton, Marshall, for concrete culverts and bridge, \$8,765. E. S. Shepard is Co. Aud.

Lewistown, Mont.—Contracts for boulevarding on 7th ave. and Broadway, amounting to \$20,900, have been awarded by City Council to L. W. Shruth, of Fargo, N. D.

New Brunswick, N. J.—By recommendation of Streets and Roads Committee, Common Council has voted to award contracts for paving six streets to Thomas H. Riddle, at total outlay of \$41,189.40. Material to be used on all streets is Westrumite asphalt, and contracts call for bluestone curbing in each instance. Total cost for six streets, as given above, includes both paving and curbing. Figures at which contracts were awarded for each street are given herewith: Albany St., \$5,844.30; Pater-son St., \$8,324.90; Cortlandt St., \$3,633.80; Condict St., \$3,172.60; Bristol St., \$3,582; Remsen Ave., \$16,631.80.

Pasadic, N. J.—By Wood Ridge Council contract for macadamizing several streets at Abner W. Gill, who was lowest bidder.

Albany, N. Y.—Following are lowest bids received by State Highway Commission at its office, No. 55 Lancaster St., Albany, N. Y., for construction of public highways by State aid on Thursday, June 25, 1914: Road No. 1175, Fairhaven village, Cayuga County; 1.82 mi.—Greece Cons. Co., Rochester, N. Y., \$30,810.60. Road No. 1195, Elmira City Division and Grand Central Ave., Chemung County, 1.14 mi.—John Kelly, Elmira, N. Y., \$25,534.75. Road No. 5340, East Branch-Sullivan County line, Part 2, Delaware County, 6.84 mi.—Nathan E. Young, Harpursville, N. Y., \$96,918.25. Road No. 5493, Batavia-Stafford, Part 2, Genesee County, 0.27 mi.—Witt & Blades, Hornell, N. Y., \$7,142. Road No. 1193, Lowville-Croghan, Lewis County, 9.17 mi.—Joseph Mascetti, Torrington, Conn., \$96,674.25. Road No. 1191, Carthage-Naumburg, Part 2, Lewis County, 6.38 mi.—Joseph Mascetti, Torrington, Conn., \$58,960.75. Road No. 1192, Naumburg-Croghan, Lewis County, 5.73 mi.—Joseph Mascetti, Torrington, Conn., \$59,613.90. Road No. 5492, Hamilton-Bouckville, Madison County, 5.79 mi.—Paddleford & King, Sherburne, N. Y., \$53,234.50. Road No. 5486, Oswego City-West Seneca St.—West Bridge St., Oswego County, 1.13 mi.—S. V. R. Malcolm & Son, Medina, N. Y., \$31,278.50. Road No. 487, Oswego City-East 9th and Oneida Sts. and State road, Oswego County, 1.47 mi.—Thomas Hucknall & Co., Albion, N. Y., \$30,709.40. Road No. 662, Rushville-Gorham, Ontario County, 6.06 mi.—Wm. H. Madden, Rochester, N. Y., \$44,232.10. Road No. 1196, Gorham-Stanley, Part 2, Ontario County, 1.89 mi.—E. R. Weed & Son, Holley, N. Y., \$15,311. Road No. 1119-A, Troy City-Spring Ave., Rensselaer County, 1.72 mi.—Edward Walsh, Troy, N. Y., \$73,566.70. Road No. 1194, Rensselaer City-High St., Rensselaer County, 0.39 mi.—James J. Rignay, Rensselaer, N. Y., \$6,058.75. Road No. 981-A, Defreestville-Couse, Rensselaer County, 3.14 mi.—Roger B. Kennedy, Utica, N. Y., \$22,845. Road No. 1115-A, 1116-A, Castleton-Rensselaer, Parts 1 and 2, Rensselaer County, 1.91 mi.—S. B. Van Wagoner, Rondout, N. Y., \$29,741.25. Road No. 5497, Ogdensburg-Waddington, Part 1, St. Lawrence County, 9.79 mi.—Y. H. Gill Co., Boston, Mass., \$110,194.33. Road No. 5494, Schoharie Village-Main St., Schoharie County, 0.70 mi.—Jos P. Scanlon, Albany, N. Y., \$20,255.20. Road No. 5488, Pat-chogue-Moriches, Suffolk County, 12.89 mi.—Frank Arrigano & Bro., Middletown, Conn., \$156,687.60. Road No. 5490, Monticello Village-Broadway and Jefferson St., Sullivan County, 1.56 mi.—Heneboldt & Washington, Monticello, N. Y., \$52,973.60. Road No. 5253-C, Jasper-Addison, Steuben County, 4.37 mi.—T. H. Gill, Boston, Mass., \$45,902.50. Road No. 5356, White Plains Village, Westchester County, 2.24 mi.—John L. Hayes, Yonkers, N. Y., \$89,373.50. Road No. 1160, Oneida-Munnsville, Part 1, Madison County, 4.96 mi.—Fort Schuyler Cons. Co., Utica, N. Y., \$39,572.50. Following are lowest bids received by the State Commission of Highways at its office, No. 55 Lancaster St., Albany, N. Y., for the repair of public highways by State aid, on Thursday, June 25, 1914: Rep. Con. No. 660, Road No. 508, Selkirk-Coeymans, Albany County—Belotte & Marchese, Troy N. Y., \$14,747. Rep. Con.

No. 330, Road No. 505, Norwich-North Norwich, Chenango County—Paddleford & King, Sherburne, N. Y., \$17,847.50. Rep. Con. No. 667, Road No. 5092, Red Hook-Rhinebeck, Dutchess County—Thomas J. Martin, Beacon, N. Y., \$9,324.40. Rep. Con. No. 668, Road No. 841, Crown Point-Port Henry, Essex County—Richard Hopkins, Troy, N. Y., \$5,548.17. Rep. Con. No. 661, Road No. 456, Little Falls-East Creek, Herkimer County; 5159, East Creek, Herkimer County; 5028, East Creek-St. Johnsville, Montgomery County—R. D. Cooper, Little Falls, N. Y., \$14,376.25. Rep. Con. No. 666, Road No. 154, Chester-Vails Gate, Orange County—James L. Kehoe, Newburgh, N. Y., \$5,828.11. Rep. Con. No. 651, Road No. 77, Albion-Wynant-skill, Rensselaer County—County Cons. Co., Troy, N. Y., \$25,644. Rep. Con. No. 577, and Road No. 436, Jericho Turn-pike-Plainville, Nassau County—Murray & Gardner, Center Moriches, N. Y., \$21,178.20. Rep. Con. No. 669, Road No. 9006, Pearl River-Manuel, Rockland County—Aetna Contg. Co., Nyack, N. Y., \$26,671.50. Rep. Con. No. 598, Road No. 441, Saratoga-Glens Falls, N. Y., Saratago County—Champlain Cons. Co., Saratoga Springs, N. Y., \$18,552.40. Rep. Con. No. 670, Road No. 5361, Yonkers-White Plains; 5321, White Plains-Rye, Westchester County—Wm. F. McCabe Cons. Co., White Plains, N. Y., \$8,710.10. Rep. Con. No. 664, Road No. 54, Briar Cliff Manor-Echo Lake; 143, Echo Lake-Pines Bridge; 587, Mt. Kisco-Millwood, Westchester County—Wm. Doyle, Saugerties, N. Y., \$5,578.83. Rep. Con. No. 665, Road No. 35, White Plains-Armonk; 20, White Plains-Cross Roads, Westchester County—Wm. Doyle, Saugerties, N. Y., \$3,086.85. Rep. Con. No. 663, Road No. 519, Mt. Kisco-Pleasantville, Westchester County—Wm. P. McDonald Cons., New York City, \$8,625.

Binghamton, N. Y.—Contracts have been closed with the Standard Oil Co. for oiling of about 9 streets.

Port Jervis, N. Y.—By Common Council to Port Jervis Construction Co. for paving Jersey avenue from Fowler street to Pennsylvania avenue at \$14,676.60.

Schenectady, N. Y.—To W. D. Goodale contract for paving and grading at sewage disposal plant, his bid being 60 cents per cubic foot for excavation and 55 cents per square yard for paving.

Morgantown, N. C.—To P. S. Minus, of Spartanburg, contract for putting down bitulithic streets.

Bellefontaine, O.—Following are bids received for paving Park St. and Brown Ave. Contract will probably be awarded to T. W. Hill of Bellefontaine. Brown St. Improvement—For stone curb and macadam foundation—T. W. Hill, Bellefontaine, O., \$13,895.36; Chester A. Miller, Bellefontaine, O., \$14,528.60; Jerry Neville, London, O., \$14,161.42; Welch & Jones, Marysville, O., \$16,076.10. For stone curb and concrete foundation—T. W. Hill, \$13,064.96; Chester A. Miller, \$13,398.60; Jerry Neville, \$13,075.42; Welch & Jones, \$16,076.10. For cement curb and macadam foundation—T. W. Hill, \$13,638.48; Chester A. Miller, \$14,528.60; Jerry Neville, \$14,546.74; Welch & Jones, \$17,360.50. For cement curb and concrete foundation—T. W. Hill, \$12,808.08; Chester A. Miller, \$13,398.60; Jerry Neville, \$13,460.70; Welch & Jones, \$17,360.50. Park Street Improvement—For stone curb and macadam foundation—T. W. Hill, \$8,510.75; Chester A. Miller, \$8,823.25; Jerry Neville, \$8,934.45; Welch & Jones, \$10,205.30. For cement curb and macadam foundation—T. W. Hill, \$7,991.65; Chester A. Miller, \$7,992.25; Jerry Neville, \$8,218.95; Welch & Jones, \$10,205.30. For stone curb and concrete foundation—T. W. Hill, \$8,381.95; Chester A. Miller, \$8,823.25; Jerry Neville, \$9,127.65; Welch & Jones, \$10,849.30. For cement curb and concrete foundation—T. W. Hill, \$7,862.95; Chester A. Miller, \$7,992.25; Jerry Neville, \$8,412.15; Welch & Jones, \$10,849.30. C. A. Inskeep is City Engineer.

Coshocton, O.—George J. Bock & Son are low bidders on new road to be opened from South Second street. Those bidding were: S. C. Kissner & Son, Delaware brick, \$35,000; concrete, \$27,000; McHugh Brothers, Springfield, brick, \$35,000; concrete, \$27,000. T. J. Norman & Son, Coshocton, brick, \$35,000; concrete, \$27,000. John Felumlee, Coshocton, concrete, \$27,500. John Hall, Coshocton, brick, \$34,985; concrete, \$26,995.33. Henderson Brothers, Coshocton, brick, \$34,906; concrete, \$26,995.33. George J. Bock & Son, Coshocton, brick, \$32,800; concrete, \$24,480.

Marietta, O.—At opening of bids for state aid roads in this county following contractors were low bidders: McGarry & Stowe, of Akron, were low bidders on Muskingum road, their bid being \$29,490. Same firm were low bidders on road above Reno, leading from Muskingum bridge to Double D fill, their bid being \$15,990. Same firm were low bidders on three-quarters of a mile of road along Ohio river south of New Matamoras, their bid being \$10,100.

Niles, O.—Contracts have been awarded by State Highway Commissioner Jas. R. Marker and O. K'd by County Commissioners for construction of Main Market Highway No. 2 from Girard to Warren. William J. Kusicker, of Youngstown, will build road from Girard to Niles for sum of \$55,766.70, and Kane & Smith, of same city, will continue highway on to Warren for \$68,972.90.

Sandusky, O.—The Andrews Asphalt Co., of Hamilton, O., was low bidder for brick pavement on Monroe st. Its bid for brick was \$51,792.20, while that of A. G. O'Donnell, local contractor, was \$53,055.72. The Andrews Asphalt Co. was only bidders on asphalt paving for Monroe st. Bid was \$49,450. Only one bid was received on Scott and 5th sts. paving jobs. H. W. Homberger, local contractor, bid \$15,245.06 on concrete. Homberger's bid does not include cement, sand or gravel to be used.

Collinsville, Okla.—To C. A. Williston, of Chicago, Ill., at \$83,000, for paving, draining, curbing and grading with vertical fibre brick on 4½-in. concrete base, cement grout filler, etc.

Altoona, Pa.—Contract for paving of Howard alley, between Eighth St. and Altoona Hospital, has been awarded to Bell-Bockel Stone Co., at cost of \$2.21 per sq. yd. Altoona brick will be used and five-year maintenance clause eliminated.

Franklin, Pa.—To Leshner and Roess contract for paving East 6th St., but Council has reserved to itself two weeks in which to decide material to be used. Bessemer brick and asphalt blocks are two materials suggested.

Johnstown, Pa.—By Council contracts for paving with brick of five city streets. Petitions for the use of asphalt on others on which bids for brick paving had been asked were received, and ordinances launched to enable the change. Contracts awarded were: Bedford street, Mack brick and grout filler, Baker-Owen Construction Co., of Johnstown, flat rate of \$2.49 per square yard. McKinley avenue, Potter National brick, grout filler, John Best & Son, \$1.97 per sq. yard. Horner street, Mack brick, grout filler, Ressler & Robertson, \$2.25 per sq. yd. Ash street, Mack brick, grout filler, John Best & Son, \$1.93 per sq. yd. Woodvale avenue, Clearfield Clay Works brick, grout filler, Ressler & Robertson, \$2.25 per sq-yd.

Lebanon, Pa.—M. Bennett & Sons, of Indiana, Pa., has been awarded by Highway Commissioner Bigelow contract for construction of roads in East Bradford township, Chester County.

New Castle, Pa.—To Charles Staff contract for paving both Cherry St. in 7th ward and Frank way by Council, his bids being considerably lower than any submitted by other contractors. Following bids were submitted: For Cherry St. paving, engineer's estimate, \$18,117; Charles Staff, \$17,242.80; Woods and Golder, \$17,495.66; M. J. Scanlon, \$17,749.60; M. E. Miller, \$18,064.94; Thorson and McKeever, \$18,293.50; Burns Brothers, \$18,540.60; For Frank way paving, engineer's estimate \$1,502.60; Charles Staff, \$1,301.30; Thorson & McKeever, \$1,450.60; Burns Brothers, \$1,547.00.

Philadelphia, Pa.—By Montgomery County Commissioners contract for repairing Ridge road turnpike, from Philadelphia city line to Norristown borough line, about six miles, to Ambler-Davis Co., at \$2 a ton for stone, delivered.

Reading, Pa.—Reading Council has awarded contracts to pave numerous streets provided in \$175,000 bond loan, and Hassam Paving Co. of Worcester, Mass., has received majority of contracts for bituminous hot mix macadam on concrete base; Fehr & O'Rourke, for Bessemer block, and John E. Weidner, also of Reading, for granite block.

South Bethlehem, Pa.—By Bethlehem Borough Council contract for paving Broad St. from New St. to Centre St.,

and Main St. from Broad St. to Garrison St., to George Hardiner, Allentown, at his bid of \$1.75 per sq. yd., amiesite to be applied on 5-in. concrete base.

Wilkes-Barre, Pa.—R. M. Rosser, a west side contractor, has been awarded contract of building sewers in Parsons borough. The Rosser firm will have to furnish a bond of \$30,000 to insure that sewer will be built before July 1, 1915. Firms bidding and their bids are as follows: R. M. Rosser—First district, \$17,499.18; second district, \$20,427.61; third district, \$3,880.92; total, \$21,807.71. M. F. O'Brien—\$17,784.02, \$20,314.73, \$4,572.40; total, \$42,671.15. Pittston Construction Co.—\$19,049.98, \$21,444.34, \$4,987.20; total, \$45,471.52. P. J. Finn—\$22,399.80, \$22,371.42, \$4,870.60; total, \$50,151.82. D. M. Rosser—\$23,705.25, \$24,411.19, \$4,189.90; total, \$52,706.34. Herrick Construction Co.—\$22,683.75, \$26,479.58, \$4,814.89; total, \$52,978.13. Moritz & Corcoran—\$24,099.45, \$24,417.37, \$5,323; total, \$53,840.42. Stephens & Giles bid on third district only, \$5,323.83. This is the result of the bids with the totals and extensions correctly carried out.

Wilkes-Barre, Pa.—To Moritz & Corcoran, contractors, of Plains, contract for paving Schoot, Maffet, Oak, Stark and Miner streets by board of commissioners. Their bid was \$65,285. Other bidders were Moses Griffith, \$65,371; Herrick Construction Co., \$66,460.10; Porter national brick was selected for paving. Commissioners ordered bond issue of \$75,000 to defray expenses of paving streets named.

Woonsocket, R. I.—The Simpson Bros. corporation of Boston, Mass., has been awarded contract by aldermanic committee on streets and bridges for paving of North Main St. from end of present paving near Monument Sq. to Winter St., and also Winter St., from North Main St., to the railroad tracks near Pond St. Granite blocks laid on 5-inch foundation, according to Hassam method, will be used. Approximate bid was \$40,940. The Simpson Bros. corporation offered four bids. One was for granite blocks with pitch and pebble joints, which amounted to \$41,500; another, which was one accepted, was for cement joints under Hassam specification, \$40,940; third bid was for \$38,476 for Hassam method with their own specifications; fourth was for \$40,156 with 5-inch blocks. Connolly & Diamond of Dorchester bid \$42,392.50 for pitch and pebble joint and \$42,504.50 for cement joints. Bid of E. B. Robert of Pittsfield was for \$47,230.50 for pitch and pebble joints.

Fort Mill, S. C.—At meeting of Town Council it was decided to extend street paving and street committee was authorized to begin at corner of White St. and pave sidewalk along Depot St. to corner of Spratt St., distance of about 750 ft.

Belton, Tex.—By Commissioners' Court contract for Temple precinct road work to W. T. Montgomery of San Antonio, his bid being lowest on work in full and lower than any combination of bids made by sections. Contract price was \$255,347 with precinct to furnish gravel and pay railroad transportation on same. The gravel is to be bought at 5 cts. per cu. yd. at pit. Mr. Montgomery loads and unloads gravel from cars. Following are bids filed covering entire work: W. T. Montgomery, San Antonio, \$255,347; Roach-Mannigan Paving Co., Memphis, Tenn., \$266,000; Richard Morey Co., St. Louis, \$476,754. Following bids were made on sections of district: Section 9—Jennings & Harrison, Pendleton, \$18,400; Howard & Taylor, Belton, \$35,582. Section 4—J. F. Hamer, Arkansas, \$56,660. Sections 1 and 2—J. S. Toby, Belton, \$10,180. Sections 1, 2, 3 and 8—Cobb & Gregory, Dallas, \$64,741.

San Antonio, Tex.—For distance of twelve miles and width of fifteen ft. South Loop will be paved with Tarvia. County Judge was given authority to enter into contract with S. E. Finley to pave road with this product. Mr. Finley agrees to lay material and keep road in good condition for period of one year. Whole cost will be close on to \$17,000, at 20 cents a sq. yd. If another coat of tarvia is needed in 1915 or 1916, Mr. Finley agrees to put on additional coat at cost of 7 cents per sq. yd.

Ogden, Utah.—By City Board of Commissioners contracts for sidewalk paving on Hudson Ave., between 23d and 24th Sts., to Andrew Ashton for \$1,572.12; on Harrison Ave., between 25th and 26th Sts., for \$733.50 and on 30th

St., between Wall and King Aves., for \$478.94, to George A. Whitmeyer & Son.

Ogden, Utah.—G. A. Heman, a Salt Lake City contractor, has been awarded contract for paving Hudson ave. between Twenty-fourth and Twenty-fifth streets to-day at his contract price of \$5,872.51. Commissioners awarded contract for paving of Twenty-seventh street between Washington and Jefferson avenues to J. P. O'Neil Co. of Ogden. Contract price was \$10,547.74.

Seattle, Wash.—By Board of Public Works for construction of concrete walks on Feist Ave. South to Johnson & Co., at \$12,960.38.

Seattle, Wash.—For construction of Des Moines-Pierce county road contract was awarded to Mattson-Carlson at sum of \$64,399.26, they being lowest and best bidder; also for construction of Derby-Woodinville county road contract was awarded to Paul Guay at sum of \$12,666.29, with extras.

Tacoma, Wash.—To Jos. Warter, Sr., for paving South 23d St. from J St. to William St. at \$26,500. W. C. Raleigh is City Engineer.

Milwaukee, Wis.—Bids for asphalt street paving contracts, the cost of which aggregates \$83,000, have been opened in public works department. Following are streets to be paved and contractors submitting lowest bids: Badger Construction Company, Forty-fourth street, from Meinecke avenue to Clarke street, \$7,422; Fourth street, from Galena street to North avenue, \$27,377; Thirty-eighth street, from Center street to Clark street, \$5,115; Forty-fifth street, from Meinecke avenue to Wright street, \$3,282. White Construction Company, Twenty-fifth avenue, from Grant street to Lincoln avenue, \$4,320. F. P. Coughlin, Chicago, National avenue, from Twenty-ninth to Thirty-second avenues, \$7,825; Cherry street from Seventeenth to Twelfth street, \$18,215; Lincoln avenue, from First avenue to Greenbush street, \$10,250.

Bridgeburg, Ont.—For constructing 34 miles of roads by Welland County Council to Standard Crushed Stone Co., Niagara Falls, at \$165,000.

* SEWERAGE

Tempe, Ariz.—Sewer bonds in sum of \$30,000 have been sold.

Long Beach, Cal.—Olmstead & Gillelen, engineers, Hollingsworth Building, Los Angeles, have prepared plans for construction of sewer system at Long Beach. Bonds for \$340,000 have been voted. Harry B. Riley is City Clerk.

Napa, Cal.—A new bond election is to be called in near future by City Council for submitting to population: Twelve thousand dollars for motor-driven fire engine and hose cart and \$10,000 for storm sewers in North Napa, to carry off flood waters which cause damage to streets in winter.

Napa, Cal.—Election will be held July 16 for voting on \$10,000 bond issue for laying of storm sewers.

Bridgeport, Conn.—On recommendation of City Engineer A. H. Terry, clerk of board, was instructed to advertise for bids for construction of sewers in Gregory St., Howard Ave., Bostwick Ave., Morris St. and South Ave.

Southington, Conn.—At special meeting of voters of borough it was unanimously voted to increase sewer fund from \$118,000 to \$135,000. Increase was mostly needed for right of way, as Bag shop in Plantsville asks \$7,500 for right of way through its property. It was also voted to give contract to the lowest bidder, Barnardino & Tommassetti of Meriden, at \$119,045.

Stamford, Conn.—Special committee which has been investigating sewerage-reduction and sewage disposal for long time has presented report to Common Council recommending adoption of Imhoff tank and chemical sterilization method of reduction.

Florida, Fla.—See "Water Supply."

Miami, Fla.—B. H. Klyce, engineer, Nashville, Tenn., is preparing plans for construction of about 31 miles of sewers. Bids will be received around September.

Champaign, Ill.—Bids will be received until 2 p. m., June 26, for construction of West Side Storm Water Sewer System. Approximate quantities are as follows: 1,210 lin. ft. 42-in. concrete pipe; laying, trenching and backfilling 450 lin. ft., average cut 10-12 ft.; laying, trenching and backfilling 820 lin. ft., average cut 8-10 ft.; 20 6-in. connections on 42-in.

pipe; 935 lin. ft. 38-in. concrete pipe; trenching, laying and backfilling 595 lin. ft., average cut 10-12 ft.; trenching, laying and backfilling 200 lin. ft., average cut 8-10 ft.; trenching, laying and backfilling 140 lin. ft., average cut 6-8 ft.; 21 6-in. connections on 38-in. pipe; 685 lin. ft. 34-in. concrete pipe; trenching, laying and backfilling 60 lin. ft., average cut 10-12 ft.; trenching, laying and backfilling 625 lin. ft., average cut 8-10 ft.; 16 16-in. connections on 34-in. pipe; 7 manholes averaging 11 ft.; relaying 50 sq. yds. brick pavement on concrete base; 50 cu. yds. concrete base; 1 1/4 tons cast-iron pipe; 932 lin. ft. 24-in. vitrified clay pipe; "Y" branches, 14 pieces 6-in. laterals; trenching, laying and backfilling 400 lin. ft., average cut 8-10 ft.; trenching, laying and backfilling 567 lin. ft., average cut 6-8 ft.; 3 manholes, average depth 10 ft. Lateral "A," or Lynn St. Branch—940 lin. ft. 24-in. vitrified clay pipe; 35 lin. ft. 12-in. vitrified clay pipe; trenching, laying and backfilling 600 lin. ft. 24-in. pipe, average cut 8-10 ft.; trenching, laying and backfilling 200 lin. ft. 24-in. pipe, average cut 6-8 ft.; trenching, laying and backfilling 140 lin. ft. 12-in. pipe, average cut 4-6 ft.; trenching, laying and backfilling 35 lin. ft. 12-in. pipe, average cut 4-6 ft.; 3 manholes, average cut 10 ft. Lateral "B," or Johnson Ave. Branch—500 lin. ft. 10-in. vitrified clay pipe; 16 pieces "Y" branches, 6-in. laterals; trenching, laying and backfilling 200 lin. ft., average cut 6-8 ft.; trenching, laying and backfilling 340 lin. ft., average cut 4-6 ft.; 1 catch basin, 7 1/2 ft. deep. O. B. Dobbins is Pres. of Bd. of Local Imp.

Elgin, Ill.—Bids will be received until 10 a. m., July 6, for construction of 37,000 lin. ft. of 6 to 15-in. sanitary sewer. M. H. Brightman is Engineer.

Indianapolis, Ind.—Plans have been adopted by Board of Public Works for construction of sewer in College Ave. from 38th to 50th Sts. Estimated cost is \$218,000, and sewer will be one of largest built in the city in many years. Sewer will take care of large part of rapidly developing territory in north part of city. It will have overflow to Fall creek.

Emporia, Kan.—Bonds in sum of \$2,700 will be issued for extension of city's storm water sewerage. F. H. Smith is City Clerk.

Brunswick, Me.—J. W. Fisher, treasurer of Brunswick Village Corporation, has opened bids for sale of \$15,000 worth of sewer bonds for extension of sewer system in southern part of town. Bonds were awarded to C. E. Dennison Co., of Boston, whose bid was 100.911 and interest.

Danvers, Mass.—Plans have been prepared by McClintock & Woodfall of Boston for sewerage disposal works.

Fremont, Neb.—City Council has approved plans and specifications presented by City Engineer Roessler for extension of sewerage system and installation of new outlet in southeast part of city and instructed Board of Public Works to advertise for bids for project. Plans call for installation of new sewer main starting at Platte Ave. on 5th St., running east on 5th to Grant, south on Grant to 1st and east on 1st to sewer ditch east of city. Proposed system will require laying of 7,948 ft. of 24-in. sewer mains at estimated cost of \$14,942.24.

Fremont, Neb.—Bids are being received for construction of sanitary sewer. L. M. Roessler is City Engineer.

Camden, N. J.—Plans are being considered for sewerage disposal plant. A receptacle tank, built beneath main trunk sewer in vicinity of Cooper River and Federal St. is being discussed.

Perth Amboy, N. J.—Resolutions have been approved for laying of 15-in. pipe sewers in various streets. Wilbur La Roe is City Clerk.

Brooklyn, N. Y.—See "Streets and Roads."

Brooklyn, N. Y.—Board of Estimate and Apportionment has authorized construction of large outlet sewer in Malba, 165-acre waterfront park on north shore of Queens county. Sewer will take course almost due north, starting at intersection of 5th Ave. and 21st St. and running under the latter street to Chesterfield boulevard and thence into Long Island Sound. New sewer, bids for which are now being advertised for, will cost approximately \$30,000, and is expected to be adequate to Malba's growth for next ten years.

Mount Olive, N. C.—Installation of complete sewerage system here is being seriously considered. It is estimated that necessary attention water works and installation of complete

sewerage system will cost city about \$30,000.

Lima, O.—Purification of Lima sewage by electricity may be method adopted in proposed sewage disposal plant. It is asserted that cost of plant using electrical method would be, including system of intercepting sewers, about \$200,000. Chairman John Keville of sewer committee of City Council has recommended that bonds for \$450,000 be sold to build sewage disposal plant.

Eugene, Ore.—Sewer Committee has recommended that lateral sewer be put in alley between Washington and Jefferson Sts. from 19th Ave. to 22d Ave. This is to be built with cement pipe, according to petition.

Altoona, Pa.—George W. Fuller, the New York engineer, who prepared plans for sewage disposal plant and outfall sewer, has agreed to plan for changing course of outfall sewer along railroad yard east of city and it will now be laid to right of Little Juniata and siphon which was to have been installed for carrying sewage across stream will not be necessary.

Beaver, Pa.—Ordinances have been adopted providing for construction of 8-in. sewer lines on various side streets.

Erie, Pa.—Ordinance introduced by Mr. Eichhorn for construction of sewer in Perry St. from the center of 23d St. south 240 feet has been passed and resolution authorizing city engineer to advertise for bids on proposed sewer carried. Another ordinance providing for construction of 9-inch sewer in Reed St. from the center of 19th north 200 feet has also been introduced by Mr. Eichhorn.

Lebanon, Pa.—Sewer specifications have been approved and bids for same will be advertised shortly.

Providence, R. I.—Resolution has been adopted appropriating \$100,000 for construction of sewers.

Knoxville, Tenn.—Council has authorized construction of sewer lateral in alley running from Rutledge pike to Linden Ave., between Lawson and Summer Aves.

Brenham, Tex.—At regular meeting of Brenham City Council special election was ordered to be held on July 21, for purposes of voting \$30,000 bonds, of which \$15,000 is to be used for extension of present sewer system, and \$15,000 for extending and improving city water works system. It is believed that voters of Brenham will vote in favor of bond issue.

Dallas, Tex.—Bids will be asked within next week for construction of sanitary sewer main from point east of Fair Park to Ross Ave. Line will be 18, 15 and 12 ins. in diameter, increasing in size as it runs west. It will be laid through Fair Park. Proposed main is to be part of sewer system which will be used in connection with municipal sewerage disposal plant to be constructed within short time. It will serve large and rapidly growing territory.

Galveston, Tex.—Following bids have been received and opened for extension of sewer laterals in southern section of city: A. C. Falligant, Galveston: For constructing complete 12,646 lin. ft. of 8-in. sewer, 46c per lin. ft.; for constructing complete 12,640 lin. ft. of 2-in. by 10-in. by 16-ft. running board, 1 1/4c per lin. ft.; for each 6-in. Y, branch T, curve or other special, 30c; for manholes (about 36), \$19.50 each. Hunter & Hunter, Houston: Construction, 48c; running board, 8 1/2c; specials, 50c; manholes, \$22. Trueheart & Jackson, San Antonio: Construction, 59c; running board, 3c; specials, 50c; manholes, \$32. Freund & Quay, Galveston: Construction, 42c; running board, 25c; specials, 60c; manholes, \$24. They were referred to Commissioner Shay, Superintendent Burgess of the waterworks department and City Engineer Dickey for tabulation and report.

San Antonio, Tex.—Council has appropriated \$41,000 for sewer extensions.

Seattle, Wash.—By Board of Public Works for construction of sewers on 23d Ave. South to A. Quarrier & V. T. Bressi at \$1,958.69.

CONTRACTS AWARDED.

Mobile, Ala.—To Jett Bros. Contracting Co., of this city, at \$13,221, for construction of storm sewers in connection with 12th paving.

Berkeley, Cal.—By City Council contract for construction of sewer in Addison and Sacramento Sts. to Karl Ehrhart at \$54,000, and in Shattuck Ave. to H. E. Franks at \$29,295.

South Pasadena, Cal.—For constructing portion of interior sewer system to

Mlaglnovich & Gillespie, 219 Bloom St., Los Angeles, as follows: 78,202 lin. ft. 8-in. vitr. pipe, 42 cts.; 2,167 lin. ft. 10-in., 48 cts.; or 8-in. cement pipe, 43 cts., and 10-in., 50 cts.; 300 ft. 8-in. and 10-in. iron pipe under railroad, \$150; 128 manholes, each \$37; 84 flush tanks, each \$70; total, \$44,951. Totals of next three lowest bids: And. Holloway, 16 S. Raymond St., Pasadena, \$48,823; Wallson & Spicer, 310 Wright & Callender Bldg., Los Angeles, \$45,746; McLean & Walsh, 6904 Holmes St., Los Angeles, \$54,466.

Washington, D. C.—For constructing sewers to Warren F. Breinze Co., 141 Q St., N. W., Washington, for constructing sewer in Wisconsin Ave. and to R. B. Werner, Willow Grove, Pa., for sewers in Woodbridge and Foxhall roads.

Indianapolis, Ind.—Board of public works has decided definitely to award contract for construction of Pogue's run drain to Dunn-McCarthy Co., of Chicago, the low bidder. Contract price will be \$907,067.31.

Mandeville, La.—Contract to supply sewer pipes to be used for sea wall, upon which work is now under way, has been awarded to Allen Tupper, of New Orleans.

New Bedford, Mass.—Three bids have been received for building and erecting screens, machinery, superstructure and appurtenances for Clarks cove screen house of intercepting sewer system, and intercepting sewer committee awarded contract to P. F. Wood Boiler Co., lowest bidder, for \$6,444. Other bids received were New Bedford Boiler & Machine Co., \$7,224; New England Structural Co., \$10,184.

Charlotte, Mich.—Contract for State and Indian creek drain has been awarded to Woolman Construction Co. at \$6,125.

Fenton, Mich.—By Common Council contract for construction of trunk sewer system about mile in length across village from north to south side to Whaley & Edwards, of Milan, Mich. Bid was \$7,136.62.

White Sulphur Springs, Mont.—To C. H. Kelly, of Kallispell, Mont., at \$10,524, for installation of sanitary sewer system and sewage disposal plant. The work includes settling tank, flush tank and filter beds, and also about 7,000 ft. of mains. Gerharz-Jaqueth Engineering Co., Great Falls, Mont., are Engineers.

Brooklyn, N. Y.—For constructing sanitary and storm sewers in Homecrest Ave., East 13th, 14th, 15th and 17th Sts. from Ave. R to Ave. U and in Ave. T from Coney Island Ave. to East 18th St. has been awarded to John C. Schrade, Inc., 2132 Beverly road, Brooklyn, at \$62,526.

Schenectady, N. Y.—For sanitary sewers in 9 streets and surface water sewers in 7 streets to Kehoe & Bisset, Schenectady, at \$5,680 and \$6,585 respectively.

Charlotte, N. C.—Contract for renovation of west septic tank at cost not to exceed \$3,000, which is amount of aldermanic appropriation, has been awarded to A. H. Guion by Executive Board. Contract price is 46 cts. for cleaning and replacing old stone and \$1.85 for new stone.

Carbondale, Pa.—For construction of Belmont St. sewer by Council to Matthias Stipp, Scranton, at 79 cts. per lin. ft.

Oakdale, Pa.—To Herron Co., Pittsburgh, for constructing sewer system, 3 Dists. complete, including pump pit and equipment, at \$23,473.

Armour, S. D.—For constructing sewer system to Allerman & McLain, Yankton, S. D., at \$11,426.

San Antonio, Tex.—Sanitary sewer contracts have been awarded as follows: Trueheart & Jackson in Ward 7, \$13,070; Bailey & Reeder in Peach St. district, \$16,003; the San Antonio Engineering & Construction Co., in Dignowity Hill district, \$5,432.25.

Seattle, Wash.—Following contracts have been awarded for sewer construction: East 56th St., to A. M. Florito, \$7,545.82; 23d Ave. South, to A. Quarrier & V. T. Bressi, \$1,958.69; Waverly Place, to Geo. W. Walker, \$32,181.29.

WATER SUPPLY

Pasadena, Cal.—Installing of larger water mains and additional hydrants are recommended.

Richmond, Cal.—At meeting of directors of water district July 22 was determined upon as date for \$2,500,000 water bond election. It was also decided to issue pamphlet setting forth in concise form various facts and figures regarding maintenance of municipal plant.